Short Historical Review

Scientific and organizational achievements of Professor of Anatomy Henryk Kadyi – Rector Vigilantissimus Universitatis Leopoliensis

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Abstract

Henryk Kadyi (1851–1912) was educated in medicine at Jagiellonian and Vienna Universities, who deepened his studies in Leipzig to obtain associate professorship in descriptive anatomy at Alma Mater Cracoviensis, in 1878. He was elected Rector of Lvov University for years 1898–1899. Kadyi organized emerging Academy of Veterinary Medicine and Faculty of Medicine in Lvov. He equipped them with excellent anatomical facilities, e.g., remarkable collections of anatomical specimens. Kadyi worked out plans and such a detailed curriculum of higher studies in veterinary medicine, that it was raised to the ranks of academic discipline. He profoundly described accessory prehyloid and suprahyloid remnants of thyroid tissue and reasoned the anatomic term of arteria radicularis magna for artery of Adamkiewicz. Kadyi’s social endeavors enabled women an access to higher education and university employment in 1895. His academic foresight, thrift and vigilance made Kadyi deserve a title of Rector Vigilantissimus.

Keywords: veterinary medicine, Lvov Faculty of Medicine, accessory thyroid remnants, arteria radicularis magna.

Biographical note

Henryk Karol Klemens Kadyi was born as a son of clerk Ludwik Kadyi and his wife Klementyna on 23rd May 1851, in Przemyśl, in a family of local intellectual elite, as his brother Jozef graduated medicine and Juliusz was elevated to Austro-Hungarian title Hofrat (Court Counselor) [1–3]. In 1869, he started studying medicine for one year until 1870, at Jagiellonian University in Cracow, but much of his education as medical student he spent at University of Vienna and graduated there with a stipend for the most outstanding young scientists thanks to Seweryn Gałęzowski Foundation [celebrated Parisian surgeon Seweryn Gałęzowski (1801–1878)] that enabled him academic trip to Austria and Germany and his scholarship at the Leipzig Zoological Institute [5, 7]. His academic route was very ambitious and took relatively short period of time from to April 1879 to October 1879 [4]. It included a stay in Vienna, at the department of Professor Carl Friedrich Wilhelm Claus (1835–1899), eminent zoologist and professor of comparative anatomy, a great enthusiast of marine zoology, a Director of Oceanographic Research Station in Trieste and great opponent of Ernst Heinrich Philipp August Haeckel (1834–1919) [5]. Then, Kadyi moved to Prague to Professor Carl Toldt (1840–1920), whose Department of Comparative Anatomy (built between 1876–1879) impressed him very much later to affect designs of anatomical facilities in Lvov [5, 8]. Next, via Drezno, Kadyi visited Leipzig because Professor Claus highly esteemed Professor Karl Georg Friedrich Rudolf Leuckart (1822–1898), at the time [4]. In Leipzig, Kadyi got accustomed with functional solutions of building of Department of Anatomy, which were introduced by an inventor of microtome, Professor Wilhelm His (1831–1904) [5]. Next, Kadyi interacted well with all the specimens of vasculature real masterpieces of anatomical technique at the highest level of the time [6]. His helpfulness for students was remarkable, as he well remembered he was also supported while being trainee. Namely, shortly after obtaining associate professorship, due to excellent appreciation of his work and academic skills by Professor Teichman and Professor J. Mayer – a President of Academy of Arts and Sciences (Akademia Umiejętności), he was awarded The Sniadecki Brothers’ stipend for the most outstanding young scientists thanks to Seweryn Gałęzowski Foundation [celebrated Parisian surgeon Seweryn Gałęzowski (1801–1878)] that enabled him academic trip to Austria and Germany and his scholarship at the Leipzig Zoological Institute [5, 7]. His academic route was very ambitious and took relatively short period of time from to April 1879 to October 1879 [4]. It included a stay in Vienna, at the department of Professor Carl Friedrich Wilhelm Claus (1835–1899), eminent zoologist and professor of comparative anatomy, a great enthusiast of marine zoology, a Director of Oceanographic Research Station in Trieste and great opponent of Ernst Heinrich Philipp August Haeckel (1834–1919) [5]. Then, Kadyi moved to Prague to Professor Carl Toldt (1840–1920), whose Department of Comparative Anatomy (built between 1876–1879) impressed him very much later to affect designs of anatomical facilities in Lvov [5, 8]. Next, via Drezno, Kadyi visited Leipzig because Professor Claus highly esteemed Professor Karl Georg Friedrich Rudolf Leuckart (1822–1898), at the time [4]. In Leipzig, Kadyi got accustomed with functional solutions of building of Department of Anatomy, which were introduced by an inventor of microtome, Professor Wilhelm His (1831–1904) [5]. Next, Kadyi interacted well with all the
members of academic staff of Department of Zoology at Zoological Institute, which, at the time of Kadyi’s visit, was about to be relocated to new buildings after being hosted in monumental Augusteum [5]. As Claus foretold Kadyi highly prized anatomical specimens prepared by Rudolph Leuckart [5]. Kadyi was so delighted that he also visited collections of comparative anatomy, which were kept in old settlements from the time of Professor Johann Friedrich Meckel (1781–1833) and in modern ones, which with great enthusiasm were shown to Kadyi’s by Professor Hermann Welecker (1822–1897), Director of Anatomical Institute in neighboring Halle, since 1876. Unfortunately, Kadyi missed lectures of Oscar Hertwig (1849–1922) and Richard Wilhelm Karl Theodor Ritter von Hertwig (1850–1937), who were famous for renowned experimental embryology, because they spent that time in Italy [5]. On his travel route, he also failed to get accustomed with laboratory of Professor Ernst Heinrich Philipp August Haeckel, so Kadyi returned to Leipzig [5]. In Leipzig, Kadyi spent very fruitful time listening to lectures on general zoology by Rudolph Leuckart, speeches on invertebrate animals by Carl Chun (1852–1914), a celebrated marine biologist and an expert of on cephalopods and plankton, proceedings on palentology of vertebrates by Hermann von Ihering (1850–1930) and fine lectures on embryology by Professor Wilhelm His. Kadyi was supported by great kindness and paternal care of Rudolph Leuckart [5]. Next, Kadyi visited Zoological Museum and Department of Anatomy in Berlin. Kadyi went to Hamburg, where he focused on Aquarium and Zoological Garden and Ethnographical Museum of Natural Sciences of J. C. Godeffroy [the so-called Museum Godeffroy, founded by Johann Cesar VI. Godeffroy (1813–1885), a wealthy trader and shipping magnate] with exceptional examples of fauna of Pacific islands and anthropology section [5]. With Leuckart recommendations, Kadyi paid short visits to Würzburg, Heidelberg, Strasbourg and Munich and Innsbruck. Via Vienna, he entered Trieste, where he studied profoundly anatomy of sea life. On his return to Cracow, Kadyi visited laboratory of anatomist and zoologist Professor Franz Eilhard Schulze (1840–1921) [5]. Scientific trip of Professor Kadyi flourished with great experience and long lasting contacts and cooperation of Kady with eminent scientists of époque. His dynamical approach made him visit all the most celebrated centers of academic zoology and anatomy in German-speaking countries. His experience of that scholarship or travel grant he utilized in his further university work as constructor and founder of establishments of Academy of Veterinary Medicine and School of Medicine at the University in Lvov [5]. In 1881, he started working in Lvov [1–3]. Kadyi was an author of a preliminary general syllabus of university studies of veterinary medicine [6, 9]. Kadyi organized excellent anatomical facilities there. In years 1881–1894, he was a Professor of Descriptive Anatomy and Histology at Academy of Veterinary Medicine in Lvov and in year 1881–1890, he was a Professor of Pathological Anatomy and General Pathology there [1–3]. Being greatly engaged in foundation of higher veterinary and medical studies in Lvov, Kadyi rejected twice the offer of the Jagiellonian University to take over the position of Director of Department of Comparative Anatomy, in 1890, and Descriptive Anatomy, in 1894 [1–3]. Instead, he directed the Department of Animal Anatomy at the Veterinary Academy of Medicine in Lvov [10]. Later, he consulted the construction projects of Lvov’s buildings of Basic Medical Sciences of Faculty of Medicine, on Piekarska Street, in Lvov, particularly the edifice of Chairs of Anatomy and Histology. He contributed to design of a lecture hall, office and all rooms of descriptive anatomy with two postmortem dissecting rooms and proper equipment for preparation of student courses of anatomical studies. He was also in charge of initial equipment of Departments of Surgery and Internal Diseases. Being a master in anatomical preparation, he made and subsequently collected numerous anatomical specimens in Anatomical Museums of both Academy of Veterinary Medicine and Faculty of Medicine at Lvov University [1–3]. By detailed organization of the Academy, he vastly contributed to raising the veterinary medicine to the rank of university discipline in the Kingdom of Galicia and Lodomeria – the crown land of the Cisleithanian part of Austria-Hungary (1867–1918) [1–3]. Actually, on the initiative of Henryk Kadyi and his colleague Professor of Microbiology and Epizootiology Józef Szpilman (1855–1920), at Lvov Academy of Veterinary Medicine, veterinary medicine was raised to the ranks of academic discipline of the university level through the whole Austria-Hungary; his actions anticipated proper reforms of veterinary studies to aim that goal in the entire Empire [6, 9]. To propagate his idea in detail, Kadyi published on necessity of reforms of veterinary studies both in Polish and German, in 1890, in Lvov and, in 1891, in Vienna [11, 12]. He cooperated well with all the members of the Staff of Academy of Veterinary Medicine, which were selected on the ground of their qualifications with no prejudices to different faith or nationality. It is worth mentioning that Kady’s great cooperator of Greco-Catholic faith (also born in Przemysł, as Kadyi), Wóldomir Kulczycki (1862–1936), became a Rector of Academy of Veterinary Medicine in the years 1917–1919. Later, Kadyi served as a Professor of Descriptive and Topographical Anatomy at the Faculty of Medicine at Lvov University from 1894 to 1912 [13]. He was in this period a main organizer of Department of Anatomy and greatly contributing co-organizer of units of other morphological sciences as Department of Histology and Embryology, later headed by Professor Władysław Szymonowicz (1869–1939) [14, 15]. Henryk Kadyi published even memory books as kinds of diaries of Veterinary Academy and Lvov Faculty of Medicine at in their statu nascendi – the first years of their functioning while he was a skilful organizer of Departments of Morphological Sciences at these high schools [9, 14, 15]. With great scrutiny, Kadyi reported on development and activity of Imperial and Royal Academy of Veterinary Medicine in Lvov, since its foundation in 1881 until the end of the academic year 1893/1894, in book publication. Henryk Kadyi was a Dean of Faculty of Medicine of the Lvov University, in the years 1896–1897 and 1911–1912 [1–3]. Due to his fundamental merits in organizational establishment of Departments of Basic Morphological Sciences and great engagement in functioning of the University, Kadyi was elected a Rector of Lvovian University.
(Rector Magnificus Universitatis Leopoliensis), in the years 1898–1899 [1–3, 16].

He greatly contributed to the development of descriptive anatomy of blood vascular system [17, 18]. He was a great social activist of human rights. Namely, Henryk Kadyi and Professor of Neurophysiology, Adolf Abraham Beck (1863–1942), made an successful, official appeal to the ministry in Vienna to authorize admission of women to medical studies and their subsequent employment in scientific departments of the Faculty of Medicine, in 1895 [1–3]. He belonged to many Polish and foreign scientific Societies. In 1889, he was granted a Corresponding Membership of Academy of Arts and Sciences (Akademia Umiejętności), a prestigious institution founded in 1872 and inaugurated in 1873 in presence of Emperor Francis Joseph, since 1919 renamed as Polish Academy of Arts and Sciences (Polska Akademia Umiejętności) [1–3]. He was a President of Polish Nicolaus Copernicus Society of Natural Sciences (Polskie Towarzystwo Przyrodników im. Kopernika), from 1894 to 1895, and Editor of the Journal of this Society, titled “Cosmos” [1–3]. Kadyi im. Kopernika, from 1894 to 1895, and Editor of the journal of pivotal importance, while being on scholarship in his studies on thyroid glands in vicinity of hyoid bone (suprahyoides base of the tongue (originally, glandula praehyoid et suprahyoid accessory remnants of thyroid) on the way of descent of thyroid at its fetal way from its embryonic site of foramen caecum, at the base of the tongue (originally, glandula praehyoides et suprahyoidoides) [21]. Kadyi published these results of his studies on thyroid glands in vicinity of hyoid bone in Archiv für Anatomie und Entwickelungsgeschichte, a journal of pivotal importance, while being on scholarship at Professor Leuckart in Leipzig, what he recorded in his proceedings after return to Cracow, in 1879 [21, 22]. At the time, Kadyi also dealt with and commented on transformation of American Spicauta, as well he prepared the oriental cockroaches (Blatta orientalis) [5]. He benefited a lot from Carl Georg Friedrich Rudolf Leuckart, whose “Textbook on Human Parasites (Menschlichen Parasiten)” made the way of Parasitology as a separate academic discipline [5]. At his Vienna stop on his route on foreign anatomical and zoological academic centers, in 1878, during the Sniadeckis’ scholarship, Kadyi also renowned his friendship with Emil Zuckerandl (1849–1910), who deepened his studies of thyroid glands as Kadyi did. Since he discerned the “processus posterior glandulae

**Kadyi’s scientific output with its practical impact**

Henryk Kadyi focused on a detailed description of praehyoid et suprahyoid accessory remnants of thyroid tissue (he used “Gruzoł tarczykowy” today “tarczyca” for Polish translation of Latin term of glandula thyroidea or thyroid) on the way of descent of thyroid at its fetal way from its embryonic site of foramen caecum, at the base of the tongue (originally, glandula praehyoides et suprahyoidoides) [21]. Kadyi published these results of his studies on thyroid glands in vicinity of hyoid bone in Archiv für Anatomie und Entwickelungsgeschichte, a journal of pivotal importance, while being on scholarship at Professor Leuckart in Leipzig, what he recorded in his proceedings after return to Cracow, in 1879 [21, 22]. At the time, Kadyi also dealt with and commented on transformation of American Spicauta, as well he prepared the oriental cockroaches (Blatta orientalis) [5]. He benefited a lot from Carl Georg Friedrich Rudolf Leuckart, whose “Textbook on Human Parasites (Menschlichen Parasiten)” made the way of Parasitology as a separate academic discipline [5]. At his Vienna stop on his route on foreign anatomical and zoological academic centers, in 1878, during the Sniadeckis’ scholarship, Kadyi also renowned his friendship with Emil Zuckerandl (1849–1910), who deepened his studies of thyroid glands as Kadyi did. Since he discerned the “processus posterior glandulae
the lateral thyroid anlage and lateral cartilage and thyroid cartilage in adulthood in his mentioned Leipziger publication, in 1878 [21, 22]. His permanent anatomical findings were propagated later and mentioned Leipziger publication, in 1878 [21, 22]. His permanent anatomical findings were propagated later and his heredity was for sure an inspiration for numerous Lvovian practitioners, like Professor of Surgery Romuald Węgłowski (1876–1935), author of celebrated textbook “Operative Surgery” (Chirurgia Operacyjna), from 1919, who graduated medicine in Moscow and from 1921 was living in Lvov working as the chief of Surgery Department at Lyczakowski Hospital) [24, 25].

Węgłowski (original transcription of the surname of the author from German paper) addressed to head and neck surgery with numerous citations of his paper on neck fistulas and cysts, particularly the most eminent one by Edward F. Ziegelman, in his finely concise paper devoted to lingual goiter in Archives of Otolaryngology, in 1932 [26–28]. Ziegelman gave there one of the finest and simplest descriptions of lingual goiter stating that at the fourth week of intrauterine growth, diverticulum is formed in the midline of the body and posterior to tuberculum impar and it undergoes solid growth downward the neck to form thyroid gland consisted of two lateral lobes and an isthmus with possible additional central or pyramidal lobe, which preserves connection in the form of progressively obliterated thyroglossal duct that forms pyramidal lobe at its lower pole and foramen caecum at its upper end at the base of tongue – the site of origin of the fetal thyroid. Ziegelman stated thyroid remnants could be found on the course of thyroglossal duct [28]. Węgłowski analyzed anatomical and embryological examinations of 246 cadavers and 75 embryos and Kadyi could have been excellent consultant for these cases [26, 27]. Actually, in 1912, Węgłowski reported the presence of the lateral thyroid anlage and lateral lobe ducts with notion that preserved partial patency of central thyroglossal duct could cause development of cysts and fistulas in the neck [26]. Węgłowski found small thymic cysts and rests in the necks both of adults as well infants in autopsies procedures, which certainly were affected by scientific soundness of Henryk Kadyi, as it is hardly impossible to assume that Węgłowski was not acquainted with Kadyi’ publication on accessory remnants of thyroid tissue, of the year 1878, which belonged to the canon of anatomic knowledge of medical doctors in Poland, at the turn of 19th and 20th century [21]. In his permanent anatomical conclusions, Węgłowski believed that lateral cervical cysts developed from the 3rd pharyngeal pouch (thymopharyngeal duct) to be cited even in papers in the end of 20th century [26, 29]. On such a huge material, Węgłowski constructed theory of the etiology of branchial cysts and sinuses, which was recognized and re-established by Meyer [26, 30]. Similarly to Węgłowski in the field of neck anatomy, Kadyi supplemented in purely morphological aspect discoveries of Professor of General and Experimental Pathology, Albert Wojciech Adamkiewicz (1850–1921), another eminent member of the Department of Anatomy at Jagiellonian University, at the time [31]. Being a diligent follower of Ludwik Teichmann, Henryk Kadyi described a few variants of vasculature, in 1881, which were variations of normal vascular system (1881) [32, 33]. In his next monograph entitled “On Blood Vessels of the Human Spinal Cord” (in Polish version dated on 1888 and in German version dated on 1889), Kadyi stated that spinal cord with its spinal nerve roots are supplied by two to 17 anterior radicular arteries (mean eight arteries), which is consent in updated state of art nowadays [17, 18, 31]. The actuality of Kadyi’s publication is so permanent that it was cited in 21st century in a paper on fetal vasculature of spinal cord to conclude that in fetal anterior spinal cord vein ran in the same manner as in adults in dual setting in lateral or ventral vicinity of the homoname artery [17, 18, 34]. Kadyi thought that there were 11 to 23 posterior radicular arteries [17, 18]. Currently, it is revealed that there is a smaller number of posterior radicular arteries and their number ranges from four to eight [17, 18, 31]. The largest anterior radicular (anterior segmental medullary) artery is called arteria radicularis magna, which sprouts typically from a left posterior intercostal artery, at the level of the 9th to 12th intercostal artery, which branches from the aorta, and supplies the lower two-thirds of the spinal cord via the anterior spinal artery [31]. Henryk Kadyi reasoned the anatomic term of arteria radicularis magna (other synonyms currently in use: great anterior radiculomedullary artery, arteria radicularis anterior magna, major anterior segmental medullary artery, great anterior radiculomedullary artery, great anterior segmental medullary artery), instead of primarily given name arteria spinalis magna for the largest anterior segmental medullary artery of lumbar spinal cord named eponymously artery of Adamkiewicz, after its discoverer [17, 18, 35–38]. Adamkiewicz and Kadyi conducted studies on spinal cord, separately on the request of Teichmann, with a greater benefit for the science as their master believed [31]. Actually, Adamkiewicz and Kadyi took advantage of a novel method of processing vascular preparations of Teichmann’s original recipe [37]. In this course, Adamkiewicz happen to accuse Kadyi of plagiarism of Adamkiewicz discoveries relating vasculature of spinal cord. The artery of Adamkiewicz was primarily named arteria spinalis magna. In response, Kadyi argued for renaming the vessel arteria radicularis magna, as he stated that adjective spinalis is more related in meaning to vertebralis and refers more to costal vertebral column, also known as the backbone or spine, than to nervous tissue of the spinal cord. Kadyi also changed a term crux vasculosa into rami anastomotici arcuati. It is assumed that Kadyi’s anatomical terms are more fitting than primary ones of Adamkiewicz’s authorship.
Anyway, Adamkiewicz got irritated with remarks of Kadyi and even unjustly accused Kadyi of plagiarism, which caused lots of confusion in front of Kadyi’s reputation of academic honesty and anatomical skillfulness [17, 18, 39]. Henryk Kadyi also published a lot on comparative anatomy of domestic animals, with special notion on the remnant of musculus pronator teres in a horse, as well as joint surfaces of the elbow joint, in 1892 [40].

One of his great merits was introduction of appliance of formalin in fixation of human cadavers, in Lvov [41]. In his written work in German, he described preservation of human body with injection of formalin into cadavers as an efficient way of inhibition of putrefaction [41]. Kadyi propagated a technique of staining of nervous system, with application of heavy metal salts [42, 43]. He presented a method of staining of the gray matter of the brain and the carmine core after treatment with uranyl acetate, in Polish Archives of Biological and Medical Sciences (Polskie Archiwum Nauk Biologicznych i Lekarskich), which he both edited and published with his extensive involvement from 1901 to 1907 [44, 45].

In his microscopic and macroscopic evaluations, Kadyi commented on organization of cell and critically reviewed knowledge about cellular and morphological components of the body, in 1892 [46].

His scientific activity certainly inspired next generations of Lvovian histologists, e.g. Professor Boleslaw Jalowy (1906–1943), who published on inervations of various anatomical structures with special issue to silver staining technique and experimentally induced argyria (accumulation of silver salts) in animal species [47].

Personality of Henryk Kadyi

Among his academic colleagues, he was highly prized as a very skilled scientist and organizer. His appearance was considered a bit eccentric one, though. In memories of the Faculty of Medicine in the second decade of 20th century [48, 49]. Namely according to Mierzecki, Kadyi belonged to prominent scholars of original appearance with long sideburns and pince-nez spectacles, always coming to Department of Anatomy on a bicycle regardless of the weather, even in the rain… equipped with umbrella [48]. His outlook was for sure original but his good-hearted nature remains even more exceptional nowadays. Kadyi watched over Faculties of Medicine and Veterinary Medicine in Lvov with such a great care, foresight, thrift and vigilance that he merits well-deserved Latin title of Rector Vigilantissimus. On inscription on his tomb, at the University in Lvov (Polish: Uniwersytet Jana Kazimierza – UJK), as well as next eminent Professors of Anatomy like Edward Loth (1884–1944), who cited Kadyi’s studies on peripheral nerves in his esteemed textbook that was a part of the most famous and comprehensive Polish-written anatomy titled “Bochenek’s Anatomy” [51, 52]. As Romanian eminent histologist Professor Iuliu Moldovan (1882–1966), Henryk Kadyi was one of numerous scientists that underwent excellent training at Vienna, the state capital city, at the time of Austria-Hungary and this education had a great influence on universality of academic impact of scholars like him [53].

Acknowledgments

Associate Professor Andrzei Wincewicz dedicates this biographical paper to his esteemed predecessor in the position of the Director of Department of Human Anatomy of UJK, Professor Piotr Chłosta, currently the President of Polish Society of Urology and Head of Urology Department of UJ in Cracow, as well as the Surgeon of the author’s Father, Józef Wincewicz (who served long decades as a specialist of internal diseases and Head of Hospital Department in Kielce and Czerwona Góra).

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