

Bridging neighboring civilizations at academic grounds: a story of Zygmunt Albert – *Rector illustrissimus ac magnificus Academiae Medicae Wratislaviensis* – a pathologist who visualized gamma-glutamyl transpeptidase

ANDRZEJ WINCEWICZ¹⁾, PIOTR WOLTANOWSKI²⁾, MICHAŁ JELEŃ³⁾

¹⁾Specialist Medical Practice – Pathologist, Non Public Health Care Unit, Department of Pathology (NZOZ Zakład Patologii Spółka z o.o.), Poland

²⁾Department of Public Finances and Financial Law, Faculty of Law, University of Białystok, Poland

³⁾Department of Immunopathology and Molecular Biology, The Silesian Piasts' Medical University of Wrocław, Poland

Abstract

The life stories can constitute more than simple biographies to remain great lessons of honesty, grit and steadfastness in keeping standards of medical science within a strong moral fiber and flexible wiseness in hard terms like in case of Zygmunt Albert (1908–2001). This eminent pathologist histochemically visualized tissue distribution of gamma-glutamyl transpeptidase in liver and other organs under various conditions. He was also deeply involved in experimental pathology of liver, particularly in his comprehensive studies on chrysoidin-induced hepatoma that should bear eponymic name Albert's hepatoma. As he had both German and Polish roots, he became an eminent personage that wisely and consequently bridged neighboring civilizations in hard terms of escalation of hate in prewar times, during World War II and in postwar period. After he meticulously recorded Nazi crimes in Lvov, he appealed for justice in case of Nazi massive murders of Lvov Professors. He obtained his Associate Professorship in Anatomical Pathology in Lvov (Lemberg) and was one of rebuilders of Medical Faculty in postwar Wrocław (Breslau) to serve as the first *Rector Magnificus* of Medical Academy of Wrocław.

Keywords: gamma-glutamyl transpeptidase, chrysoidin-induced hepatoma, carcinoembryonic antigen, Lvov, Wrocław, history of pathology.

To everlasting memory of great Surgeon Transplantologist and Medical Historian
 Prof. Dr. med. Dr. h. c. mult. Waldemar Kozuschek, Dean of the Medical Faculty at Bochum University, Germany.

Review paper with elements of original biographical study.

Introduction

The biography of Rector of Wrocław Medical Academy with splendid achievements in the field of hepatopathology, Zygmunt Albert (1908–2001), is didactic lesson addressed in the first place to medical practitioners, but it is of great advantage to all that care for integrity and humanity in any society. Albert documented his life in detail in his autobiographical sketches [1, 2]. In turn, our review with elements of biographical study aimed at updated description of his scientific achievements with appliance of current medical terms in the field of pathology. In the paper, we also largely focus on how Zygmunt Albert witnessed and tried to counteract great sufferings of the society due to Nazi and Communist totalitarian regimes [1].

Materials and Methods

We have retrieved databases of multitude of sources. However, our paper is secondary to fine autobiographical sketches of Zygmunt Albert and concise publications of Waldemar Kozuschek (1930–2009) [1, 2]. Therefore, we humbly recognize our work as review paper with

elements of original biographical study, because most of pioneer biographical work was done before our current paper by Zygmunt Albert by himself and Waldemar Kozuschek [1, 2]. Anyway, we strived to ground our study basically on primary resources and referred when possible to mentioned biographical reports made by Albert by himself. We analyzed documents found, e.g., in the Section of Special Collection, Stanisław Konopka Main Medical Library in Warsaw, the Archives of the Medical University of Wrocław and Section of Manuscripts of the National Library of *Ossolineum* in Wrocław. The authors have highly appreciated *in situ* sources (mainly reports of witnesses of that time), e.g., information given by close cooperator of Zygmunt Albert, Professor Bożenna Zawirska (the tutor of Professor Michał Jeleń) [3].

Results

Galician period of life – dealing with diversity of nations with respect to human dignity

Zygmunt Albert was born in Polish-German family on 30th October 1908, in Turka (now Typka), at the river

Stryj, in the Kingdom of Galicia and Lodomeria (Galicia) of Austro-Hungary (Ukraine now) [1, 2].



Figure 1 – Zygmunt Albert in front of Ludwik Hirszfeld Institute of Immunology and Experimental Therapy at the 8th Congress of Polish Society of Pathologists (7–8.09.1979) (the first from the left) in Wrocław, in company of Professor Maria Kobuszevska-Faryna (1920–2009) (third from the left) (Head of Department of Pathomorphology at Medical Centre for Postgraduate Education in Warsaw) and Professor Bożenna Zawirska (1923–2007) (second from the right) his successor in the Chair of Department of Anatomical Pathology in Wrocław. Courtesy of Professor Michał Jeleń (the photo from his Archives at Medical University of Wrocław).

His father, Leopold Albert, was German native, who held the position of Director of local post office and his mother was Polish. Zygmunt Albert studied medicine at the King John Casimir University in Lvov (Polish: Uniwersytet Jana Kazimierza – UJK) (Lviv, Lemberg) [1–4]. Soon after graduation, he started his work in Department of Pathological Anatomy. His doctoral thesis was focused on syphilitic aortic changes in progressive paralysis in tertiary syphilis, particularly neurosyphilis, on 5th July 1935 [1–5]. In 1939, Albert obtained habilitation *veniam legendi* in the field of Pathological Anatomy at the Faculty of Medicine of the King John Casimir University in Lvov [1, 2]. He was employed in the position of Associate Professor from October 1939 to June 1941, in Soviet Medical Institute (Medinstitut) [1, 2]. After German invasion on Lvov, Zygmunt Albert's tutor Professor Witold Nowicki was arrested and shot to death from 3rd to 4th July 1941, in execution of over 20 Professors at Wuleckie Hills in Lvov [6–9]. Zygmunt Albert preformed his investigation at the site of murder and confronted his findings with information given at the time by eyewitnesses [6–9]. During Nazi occupation, Department of Pathological Anatomy was incorporated in the new institution in lieu of former University and was named Staatliche Medizinisch-Naturwissenschaftliche Fachkurse Lemberg since 1942, that was supervised by Karl Schulze (1905–1966) [1, 2, 6, 7]. German Military Unit of Pathological Anatomy (Heeresuntersuchungsstelle der Wehrmacht) was also located in the building of former academic Department of Anatomical Pathology of Lvov University. Remarkably, Zygmunt Albert recalls that his relations were proper and particularly fair with German military pathologist Gerhard Sponholz (1896–1964) [1, 2, 10]. Albert even

remarked in his memories a talk with Sponholz, who was deeply collapsed by the fact of massive murders particularly of Polish Jews in the region and later got severely injured in backbone at Eastern front [1, 2, 10]. He even asked Albert in despair and the depth of his sorrow, how members of his nation, who continually killed lots of innocent people, could mentally endure this crime of genocide [1, 2]. Actually, besides Sponholz, Schulze and both of successors of Sponholz [Heinz Raab (1909–1966) after war Associate Professor of Pathological Anatomy in Wien and Carl Böhne from Hamburg] were sensitive enough to Albert's influence to employ young Poles in positions of autopsy technicians and auxiliary staff with issue of official documents that prevented these youngsters from deportation [1, 2]. Germans went back from Lvov on 27th July 1944, in front of Soviet Army. On 29th July, at meeting of restoration of Soviet Medinstitut, Polish excellent anatomist, Tadeusz Marciniak (1895–1966) was elected a Dean [1, 2]. However, it was clear that it is going to be only provisional position for him, as Polish intellectual elite was as unwelcomed in Lvov (Lemberg), as German academicians in Wrocław (Breslau) at the time [1, 2]. Prof. Albert left Lvov on 15th December 1945 [1, 2].

Postwar restoration of Chair of Pathological Anatomy in Wrocław

He stopped in Katowice on 23rd December and on 24th December 1945 (Christmas Eve) was met with a warm reception by his colleague from medical studies, Director of local hospital, Dr Marian Geisler, in Zabrze [1, 2]. On 2nd January 1946, Albert noted that he together with his father Leopold traveled in unheated train without panes of glass in windows to Wrocław to visit Professor Ludwik Hirszfeld (1884–1954), a Dean of the postwar Faculty of Medicine in Wrocław, in response to his invitation on 3rd January 1946 and to be nominated a Head of the Chair and Department of Pathological Anatomy there on 4th January by Rector, Professor Stanisław Leon Kulczyński (1895–1975). Immediately, Albert started organizing scientific, professional, diagnostic laboratory and didactic background [1–4]. He actually rebuilt proper infrastructure from ruins of war [1–4]. Experimental laboratory was also organized with great engagement of Kazimierz Mędraś (1912–1970). In January, lectures and students' exercises in autopsy and histopathology begun with help of Henryk Starzyk (1911–1989) [1, 2]. Similarly, laboratory technicians from Lvov belonged to primary staff of Department of Pathological Anatomy in postwar Wrocław, which was soon supported by talented students of medicine, who were employed in the roles of Deputy Assistants, e.g., student of 4th year Bożenna Zawirska (1923–2007), subsequent Director of Pathological Anatomy Department from 1979 to 1990 [1–4]. Albert also headed the Department of Experimental Oncology at the Institute of Immunology and Experimental Therapy of the Polish Academy of Sciences in Wrocław [4]. In the first years of functioning of Polish Academic Department of Pathological Anatomy, Zygmunt Albert faced shortage of medical equipment as former hosts evacuated or hid most of devices as binocular microscope and 15 didactic monocular microscopes under a podium located in prewar magnificent, neogothic edifice of Anatomical Pathology in Wrocław [1, 2].

Defense of academic autonomy during communist regime in postwar Poland

In 1950, following a Soviet pattern, medicine and pharmacy were excluded from the body of the University and started to constitute a separate High School under the name of Medical Academy [1, 2]. On 1st January 1950, Zygmunt Albert became the first Rector of Medical Academy in Wrocław. Zygmunt Albert had to maneuver wisely to defend academic employment of professionals, which was endangered by replacement by activists of the Communist Polish United Workers' Party (PUWP; Polish: Polska Zjednoczona Partia Robotnicza, PZPR). The regime aimed at exchange of intellectual elite on Polish Universities to gain totalitarian control over these institutions. In atmosphere of highly unjust discrimination, a very useful and talented employee Maria Plater-Chodkiewicz was expelled from Department of Pathological Anatomy [1, 2]. Her surname made unwelcomed, aristocratic connotations to Herebold de Bröel, called Plater, and his grandson Johann, who was granted a fief in the Duchy of Livonia (German: Herzogtum Livland), as well as Field Hetman of Lithuania Jan Karol Chodkiewicz (1561–1621) [11, 12]. Students who belonged to so-called primary organization of party (Polish: Podstawowa Organizacja Partyjna) used their ideological activity in instrumental manner to pave their way to academic carrier [3]. They aimed at firing the esteemed Lvovian Professor Adrian Demianowski (1887–1959) from the position of Director of Psychiatry Department [1, 2]. They primitively denounced the Professor on occasion of offending opinion about Stalin that was expressed by mentally ill patient during students' exercises [1, 2]. Professor Demianowski was accused of scandalous provocation, being at severe risk of loss of the work at Medical Academy. To rescue him, Zygmunt Albert asked Warsaw member of Communist Party, born in Lvov, Professor Andrzej Jus (1914–1992) (later Professor of Medicine in Toronto, Canada) for expertise, if the didactic standards were fulfilled and his opinion was favorable for his former tutor Adrian Demianowski [1, 2]. To avoid preventive actions of the Rector Albert, communist students finally went to Warsaw and directly made Dr Władysław Barcikowski (1916–2015) Vice-Minister of Health to sign a dismissal of Professor Demianowski [1, 2]. Their obsessive attempts got even more exaggerated and ridiculous, when they appealed to Rector Zygmunt Albert to move a formal proposal for the name: Joseph Stalin Memorial Medical Academy of Wrocław [1, 2]. Albert wisely and artfully responded that such an idea should first be consulted with Joseph Stalin personally, as he could be dissatisfied with giving his name for a relatively small high medical school [1, 2]. In this masterful way, Zygmunt Albert once again defended a dignity of University in totalitarian system [1, 2]. Zygmunt Albert wisely avoided passing himself in history as an eventual contributor to naming of part of Wrocław University (its detached Faculty of Medicine and Pharmacy) – Medical Academy of Wrocław, with the name of a mass murderer and dictator. For sure, for Zygmunt Albert it did matter a lot that in the foundation act in the rank of Golden Bull (*Aurea Bulla*

Foundationis Universitatis Leopoldinae Wratislaviensis), dated on 1702, Holy Roman Emperor Leopold I (1640–1705) dedicated Breslau (Wrocław) University to Saint Mary, what is clearly depicted in later baroque frescos of life of Saint Mary in the vault of *Oratorium Marianum* painted by Johann Christoph Handke (1694–1774), and completely reconstructed until 2014, by Christoph Wetzel (b. 1947), after bombing during World War II [13]. Finally, in 1989, in the year of collapse of communist system in Poland, the Medical Academy was given the name of the Silesian Piasts, the ruling family of unifying statesmen that conditioned prosperity of lower Silesia by fruitful marriage of neighboring German and Polish civilizations [14].



Figure 2 – Zygmunt Albert in the gown of Rector Magnificus of Wrocław School of Medicine. Courtesy of Professor Michał Jeleń (the photo from his Archives at Medical University of Wrocław).

Didactic engagement and scientific achievements in the field of Anatomical Pathology

From the very start, Albert's lectures gained such a popularity that some skilled students decided to write down them carefully, to edit and print in this way script of lectures after verification by the Professor. The book was called unofficially "Little Albert" [1, 2, 15]. In scientific heritage of Zygmunt Albert, there are over 110 publications [2]. In his prewar period, Albert focused on microscopic presentation of malignant hepatoma, neoplasms of pituitary gland, tuberculosis of brain, perforated tuberculous bowel ulcers, organ pathology of *Escherichia coli*, perforated, gangrenous appendicitis due to *Pseudomonas aeruginosa* infection in a few-week-old newborn, hermaphroditism, giant cell tumor of the sphenoid bone parasitic issues, e.g., large cysticercus in course of *Taenia solium* infestation

and some malignant tumors as the case of two synchronous tumors of colon: conventional adenocarcinoma of sigmoid and gelatinous mucinous adenocarcinoma of caecum [16–25]. In routine differential diagnosis of necrotizing granulomas, he published report on *granuloma gangraenescens* [26]. As his doctoral dissertation referred to syphilitic aortic changes in progressive paralysis in tertiary syphilis, he continued his interests in pathology of cardiovascular disorders [5]. Namely, Albert investigated pediatric aortic lesions in relation to atherosclerosis [27]. In times of great frequency of rheumatic disease of heart, he also inspected myocardial changes in children, in course of acute and chronic diseases [28]. He particularly focused on myocardial fragmentation in convulsive and manic disorders [29, 30]. Being absorbed in mechanisms of lipid storage, in his doctoral dissertation on aortic syphilitic alterations, he noticed that there is an early onset of intramural lipid accumulation in sixth month of life, with similar distribution as in adulthood with intensity conditioned by secondary dyslipidemia-inducing primary illness [5]. Furthermore, he focused on lipid granulomatosis of a child (lipoid granulomatosis in nomenclature at the time) in course of Hand–Schüller–Christian disease, as presentation of Langerhans cell histiocytosis, with first report on deposition of multitude of xantomas in dermal and mucosal location [31]. He also investigated occurrence of multiple tumors within one patient with notes on possible etiological background of lipomatosis and neurofibromatosis [32]. In diagnosis of primary malignant tumor of adipose tissue, he used the term lipoblastosarcoma in brackets to underline that presence of lipoblasts is a criterion for diagnosis of liposarcoma [33]. Together with Kazimierz Mędraś, he reported on post-radiation alterations in morphology of ovarian tumors [34]. Seeking morphological prognostic factors in mitral stenosis, Albert reported on biopsies of the lung and atrial appendages together with thoracic cardiac surgeons Wiktor Bross (1903–1994) and Anatol Kustrzycki (1924–1987) in Wrocław [35]. With surgeon and nephrologist Tomasz Szepletowski (1933–2017), Zygmunt Albert reported which functional hepatic alterations would be reflected in microscopic liver morphology, in course of ulcer of stomach and duodenum or in course of cholelithiasis [36, 37].

Albert cared for scientific development, so he fulfilled a fellowship of *World Health Organization* (WHO), in 1947, in London, at Sir Alexander Haddow (1907–1976) Director of Chester Beatty Cancer Research Institute in London, who successfully applied Myleran in therapy of leukemia [1]. There he was given Wistar rats with transplanted neoplastic tumors for his experimental start-up [1, 3] as well he was granted with over a dozen complete annual issues of *Journal of National Cancer Institute* and subscription for following years. He managed to launch direct international contacts not only with German-speaking scientific West European centers, but also he was sent with a breed of white mice from Institut Gustave Roussy, located in outskirts of Paris. He visited Paris, Basel, and Zurich and returned to Wrocław in the beginning of 1948 [1].

Achievements in pathology of circulating markers

Albert organized a team of hard-working explorers, such as excellent biochemist Apolinary Szewczuk (1928–2002), to focus on studies of cancer markers. They devised method of histochemical identification of gamma-glutamyl transpeptidase and described its distribution in solid mammalian tissues in *Nature* publication in 1961 [38]. He investigated also quantity of gamma-glutamyl transpeptidase in various tumors (e.g., renal cancer) and non-neoplastic tissues (e.g., nervous tissue) [39–42]. Albert and Szewczuk provided biochemical characteristics of gamma-glutamyltransferase in experimental model of Morris hepatomas 5123D in Buffalo and in F1 (Buffalo × Wistar) rats [43–45]. Apart from gamma-glutamyl transpeptidase, Albert and Szewczuk investigated multitude of enzymes in histochemical and biochemical aspects studies, e.g., glycyl peptidase, glycyl arylamidase, Co²⁺-activated acylase, pyrrolidonyl peptidase, tumor hydrolases [46–49]. With broader team of co-operators from Wrocław and Poznań, Albert focused on radioimmunological method of detection of carcinoembryonic antigen (CEA) [50]. He also proved that quantity of CEA could differ among liver metastases of rectal adenocarcinoma [51]. Zygmunt Albert and Antonina Harłodzińska evaluated CEA-like antigens in various histopathological types of human pulmonary carcinoma, later to comment broadly on antigenic heterogeneity of lung cancers [52, 53]. Furthermore, presence of CEA was described in gynecological cancers both in serological and histopathological aspects [54]. CEA expression was also shown in metastases of mesenteric lymph nodes of patients with adenocarcinoma of gastrointestinal tract as well [55].

Toxicology-oriented studies in the field of experimental pathology of tumors

The scientific activity of Zygmunt Albert was strongly associated with his medical service to community in the field of diagnostic pathology. Even his works in experimental pathology that showed toxicity of various agents were so clinically oriented, that many harmful chemical substances were banned from being a component of food dyes preservatives or medical drugs [56]. Due to his engagement in experimental pathology, he was made a Head of Department of Experimental Oncology and Therapy of Polish Academy of Sciences in Wrocław, in 1952. In his first works on experimental oncology, he demonstrated that some dyeing agents used in food and pharmaceutical industry, like Prontosil and chrysoidine are carcinogenic and started a battle for official ban on appliance of these agents with delayed success, which was forced by need of adjustment to international standards [1]. Examining quite a wide range of potential carcinogens, he proved that nitrogranulogen spontaneously triggers tumorigenesis in mice [57]. In his surveys, he identified nephrotoxicity of red Prontosil [58]. Eventual effect of Prontosil was also investigated on the growth of Crocker's sarcoma, as well as pulmonary adenomas in mice [59, 60]. Chrysoidine was found to be causative agent of adenoma and cancer [61, 62]. All these damaging effects were aggravated by prolonged use of mentioned hazards [57, 58]. With insight in metabolism of this tumor, he focused on enzymatic profile of chrysoidine-induced hepatoma,

particularly activity of glucose-6-phosphatase, as well as eventual changes of lysozyme activity in organs from individuals with this type of neoplasm [63–65]. Members of his staff got focused on profound characterization of this hepatoma. For example, under Albert's supervision, Wiktor Djaszenko described ultrastructural variety of nucleoli, mitochondria and vacuoles with configuration of canaliculi of endoplasmic reticulum and accumulation of ergastoplasm at cellular periphery, while Mędraś identified peripheral pigment as porphyrin in the texture of this experimentally induced tumor [66, 67]. With cardiac surgeon Anatol Kustrzycki, Zygmunt Albert described afferent and efferent blood supply of chrysoidine-induced hepatoma with angiography method [68]. Considering all, Waldemar Kozuschek postulated that chrysoidine-induced hepatoma should bear eponymic name of "Albert's hepatoma", but his discoverer was too modest to agree for this idea [2]. Zygmunt Albert even explored a possible influence of one malignancy on another one simultaneously developing in one individual, as in reports on growth Crocker's sarcoma on chrysoidine-induced hepatoma and mammary carcinoma in mice [69]. Similarly, he studied two adjacent, different Methylcholanthrene-induced tumors [70]. Albert realized that various tumors are not neutral to each other in his simultaneous growth in one patient. Together with highly cited immunologist Antonina Harłodzińska-Szmyrka (1939–2015), he consequently investigated response of the host to a tumor in the body particularly in tumors of gastrointestinal tract [71–73]. He investigated impact of bee's venom on neoplastic tumors on experimental grounds [74]. He also tested if human tissue extracts could contribute to induction of neoplasms in rodents [75]. He searched how much transplantable human and murine tumors could be, e.g., in the site of anterior chamber of eye in rabbits and guinea pigs [76]. Zygmunt Albert, together with Professor Harłodzińska, conducted his own experimental studies on transplantable hamster sarcoma, whose tumor was grown from the human cell culture [77]. Albert sought for environmental factors in rodent spontaneous mammary cancer and malignant sarcomatous tumors [78]. He pointed on potent impact of environmental factors and neuro-hormonal background on development of rodent cancers with report of significantly higher incidence of mammary carcinoma in mice that were segregated in two individuals per a cage of the same size, in comparison to rodents, which were kept in number 25 subjects per cage [1, 3].

In 1963, Albert was elected a corresponding member and, in 1969, a member of Polish Academy of Sciences [1, 2]. Zygmunt Albert promoted 13 medical doctorates and initiated four Associate Professorships of his co-operators: Czesław Majewski, Bożenna Zawirska, Antonina Harłodzińska-Szmyrka, Henryk Starzyk. His scientific team conducted over half thousand of research projects. On 30th September 1979, at the age of 70, Professor Albert retired but he still consulted challenging, histopathological cases at the Department of Anatomical Pathology. In beginning of December in 1981, he went to Western Germany to visit his son and family and in meantime, on 13th December 1981, a Martial Law in Poland (Polish: Stan wojenny w Polsce) was announced against political opposition to break down any communication in Polish

People's Republic [2]. At this point of life, Albert once again faced a brutality of totalitarian regime, when his wife underwent a lethal heart infarction in the climate of severe restrictions and fear due to forced prolonged separation from her husband [2]. In this tragic moment, there was none closest member of the family in Poland, as his wife died on 11th January 1982 [2]. Thus, Zygmunt Albert was persuaded by his son not to return to Poland but to remain with his family abroad, while Federal German Republic provided comfortable conditions for Poles seeking asylum at the time [2]. Zygmunt Albert died on 7th October 2001, in Germany [2].

To rescue from forgiveness – pioneer documentation in the field of history of medicine of prewar Lvov and postwar Wrocław

Abroad, in Germany, Zygmunt Albert focused on continuation of his excellent studies in the field of history of medicine. Indeed, he spent elaborately the time of his retirement in Germany. Some of biographical papers, e.g., about his Lvovian tutor murdered by SS-troops, Professor Witold Nowicki and obituary paper on Kazimierz Mędraś or biographical sketch of Tadeusz Ostrowski, he managed to prepare before emigration [79, 80]. Here it is the proper place to confess with some confusion that at least one co-author of the present paper (AW) missed citation of Zygmunt Albert's publication about Witold Nowicki issued in *Polish Journal of Pathology* (*Patologia Polska* at the time) of the year 1950, in his article about Professor Nowicki, in 2016, being unaware of existence of this biographical report [81, 82]. In the same year 1950, Albert commemorated a silhouette of great Lvovian biochemist, Professor Jakub Karol Parnas, basically on grounds of his own original records completed during World War II [83]. As the most competent and qualified person, Albert gave a pioneer description of postwar history of Department of Pathological Anatomy in Wrocław, in period of 1945–1970 [84]. Therefore, his essays were in part solid grounds for great Polish-German surgeon transplantologist, brilliant historian of medicine and Dean of the Medical Faculty at Bochum University, Prof. Dr. med. Dr. h. c. mult. Waldemar Kozuschek (1930–2009), to write great books about the development of medicine, particularly pathological anatomy in Wrocław [2, 14]. He cherished a memory of Lvovian University to comment at the time, e.g., report of Prof. Witold Ziembicki on Department of History of Medicine in Lvov, in period of 1942–1944 [85]. He described in detail the history of pathological anatomy in Lvov from XVIII to XX century [86]. He provided excellent biographical papers about other Lvovian Professor of Pathology Andrzej Obrzut (1854–1910), Associate Professor Helena Schuster (1884–1947) and Professor of Hygiene Paweł Ludwik Kucera (1872–1928) [87–89]. Similarly to case of Prof. Nowicki [82], Zygmunt Albert's biographical sketch about Andrzej Obrzut was not cited in a recent commemorative paper about Andrzej Obrzut by Zerbino & Volos [90]. These are at least minor reasons why the current team of authors decided to write a biographical paper that would address and remind about most of scientific heritage of

Zygmunt Albert. Above all these impressive works, Zygmunt Albert elaborated and gradually completed his profound documentation of massive murder of Lvovian Professors by Nazi troops in 1941, as he was a professional investigator at the site of the crime [6–9]. Over 20 Lvovian Professors (including Supervisor of Zygmunt Albert, Professor Witold Nowicki) were murdered at Wuleckie Hills, at dawn of the 4th July 1941, by Einsatzkommando zur besonderen Verwendung, commanded by SS-Brigadeführer Karl Georg Eberhard Schöngarth (1903–1946), who previously organized imprisonment of academicians of Jagiellonian University [2, 91]. As Cracow Professors were released from the Sachsenhausen concentration camp, due to the magnitude of international protests, the grim scenario was far more immediate in case of Lvovian scientists [1, 92]. Zygmunt Albert reported terrible facts with pure honesty, in concordance of statements of Lvovian Associate Professor of Art History, Countess Karolina Lanckorońska, daughter of Grand Chamberlain of Imperial Court of Franz Joseph I (1830–1916), Karol Lanckoroński (1848–1933) and Margaret Lichnovsky (1863–1957), a sister of Prince Karl Max Lichnowsky (1860–1928) (Imperial German Ambassador to the Court of St. James's), who organized a prosperous production and processing industry of milk in Kuchelna, in Silesia, as well as the biggest factory of linen there in the whole imperial Germany at the time [91]. Nazi segregation of people due to their origin appeared truly ridiculous, if we took a closer look at these most appealing witnesses of the crime. Thus, like Zygmunt Albert, Lanckorońska was half-Polish, half-German in genealogical aspect [1, 2, 91]. Indeed, such a great intellectuals and academicians as Karolina Lanckorońska (1898–2002) and Zygmunt Albert were the best witnesses to unmask evil of racism [1, 91].

Interestingly, the concepts of genocide and crimes against humanity were based on the work of Raphael Lemkin (1900–1959) and Hersch Lauterpacht (1897–1960), whose core of their legal education was associated with Lvov. The creator of the term “genocide” (from the Greek word *genos* – meaning race and strain and Latin *cide* – to kill) was Polish-American lawyer Raphael Lemkin [93, 94]. The great Polish-British lawyer Hersch Lauterpacht developed the concept of crimes against humanity [95]. The terms, they coined, perfectly conveyed the intrinsic horrors of this type of deeds as Nazi massive murders [96]. It was characteristic for Lemkin to incorporate in the category of genocide both deeds that cause biological extinction of an ethnic group, as well as acts aimed at destruction of the identity and culture of the group particularly the whole nation *via* elimination of the most aware of its representatives – intellectual elite of the nation [93]. Such a severe discrimination was also executed by Nazi Germans to German born and German speaking Professors of Medicine, *e.g.*, Neurology and Pathology (some of them of Jewish origin) in the Third Reich [97–99]. In this place, it is worth to mention once again the fact that Polish intellectual elite was as unwelcomed in Lvov (Lemberg) as German academicians in Wrocław (Breslau) in postwar time of Soviet domination to conclude that such an aggressive effect is a rule of a totalitarian regime in general [1, 2].



Figure 3 – Zygmunt Albert, a distinguished Professor of Pathology. Courtesy of Professor Michał Jeleń (the photo from his Archives at Medical University of Wrocław).

✉ Conclusions

Once restarted by Zygmunt Albert, development of postwar Wrocław pathomorphology, particularly in the field of experimental pathology, continues its superb tradition [100, 101]. Testimony of Zygmunt Albert perfectly fits the genius loci of Wrocław University (*Universitas Wratislaviensis*), which attracted such eminent medical doctors that constituted a mixture of nationalities, faiths and traditions as famous surgeon Jan Mikulicz-Radecki (Johann Freiherr von Mikulicz-Radecki) (1850–1905), Leopold Auerbach (1828–1897), Alois Alzheimer (1864–1915), Breslauer medical student and Nobel Prize laureate in Physiology or Medicine Paul Ehrlich (1854–1915), Albert Neisser (1855–1916) or Max Bielschowsky (1869–1940), among the others of scientists with eponymic significance in world medicine [14, 102]. Their effort grounded development of academic medicine in most practical aspect in service to the society. By their devotion, they truly celebrated a high dignity of Wrocław University, that was once emphasized by composition of Academic Festival Overture (German: *Akademische Festouvertüre*) by Johannes Brahms (1833–1897), as tribute to heritage of Wrocław University on the commission of its authorities, in 1880 [103]. By his consequence, justice, reconciliation and providence, Rector and Professor of Pathology Zygmunt Albert was perfect in building bridges between Polish and German civilization and was rock-like in his permanent standards even in such terrible times of dehumanization as World War II. In his composure, he calmly fought against debasement of human dignity in envious totalitarian period of Soviet and Nazi occupations. Zygmunt Albert was severely oppressed by communism, similarly to great Romanian researcher in the field cellular immunity Iuliu Moldovan (1882–1966), but in case of Albert, persecutions did not culminate in imprisonment by communist regime as in Moldovan's case [104]. However, these two brilliant immunologists both shared the sorrowful experience of totalitarian system [104].

In steadiness of his mind and professional effort, he gained an increasingly potent influence and a healing authority that culminated in postwar period, as he became a great and magnificent figure in pathology and academic world in Poland.

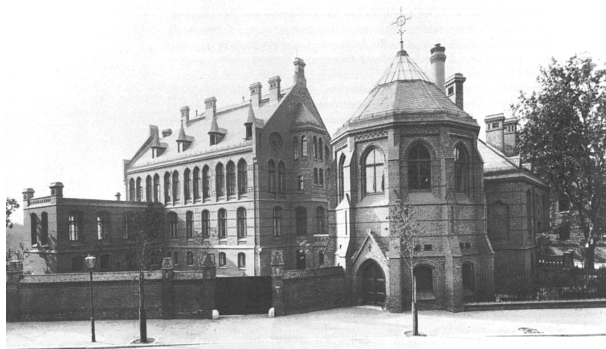


Figure 4 – Department and Chair of Pathomorphology of Wrocław University – that still resembles architecture of Charité University campus in Berlin – in its historical edifice (at Karol Marcinkowski Street, former Robert-Koch-Straße), which was built mainly in the years 1890–1892 and was designed with novel separation of Prosectorium from the main building at the time of Professor Emil Ponfick (1844–1913) (the photo from public prewar resources).

That is why, the nature of this person truly reflects and deserves a meaningful title *pontifex medicus*, once used instead of more popular *pontifex maximus* [*pontifex* from Latin (*pons, facere*) – “builder of bridges”, *pontifex maximus* – a name of Etruscan tradition for the priest of the highest office, founded by legendary Numa Pompilius (753–673 BC), the second legendary king of Rome appreciated for his wisdom, devotion and peaceful attitude] [105].

Conflict of interests

The authors declare that they have no conflict of interests.

References

- [1] Albert Z. Autobiographical sketches [Szkice autobiograficzne] 1939–1981. Arch Hist Filoz Med, 1996, 59:1–128.
- [2] Kozuszek W. The development of Pathological Anatomy at the University of Wrocław and the Medical Academy in Wrocław [Rozwój anatomii patologicznej na Uniwersytecie Wrocławskim oraz w Akademii Medycznej we Wrocławiu; Die Entwicklung der Pathologischen Anatomie der Universität Breslau sowie der Medizinische Akademie Wrocław]. Wrocław University Press, Wrocław, Poland, 2007, 1–337.
- [3] Zawirska B. Zygmunt Albert. Polish Science (Nauka Polska), 1972, 1:116–122.
- [4] Jeleń M. Prof. Zygmunt Albert, obituary. Gaz Lek, 2001, 11:11.
- [5] Albert Z. Syphilis of the main artery in progressive paralysis and in other cases [Zapalenie kiłowe tętnicy głównej w porażeniu postępującym i w innych przypadkach]. Polish Academy of Skills and Sciences (Polska Akademia Umiejętności), Kraków, 1938, 1–44.
- [6] Albert Z. Lvov Medical Faculty during the Nazi occupation of 1941–1944 [Lwowski Wydział Lekarski w czasie okupacji hitlerowskiej 1941–1944]. Ossolineum Press, Wrocław, Poland, 1975, 1–119.
- [7] Albert Z. Murder of 25 university professors in Lvov by the Nazis in July 1941 [Zamordowanie 25 profesorów wyższych uczelni we Lwowie przez hitlerowców w lipcu 1941 r]. Przegl Lek, 1964, 20:58–77.
- [8] Cieszyński T (Editor's note and comment: Albert Z). Functioning of the Medical Faculty of UJK in Lvov during World War Two from September 1939 to August 1944 [Działalność Wydziału Lekarskiego UJK we Lwowie w czasie 2 wojny światowej od września 1939 do sierpnia 1944 roku]. Arch Hist Filoz Med, 1995, 58:141–152.
- [9] Albert Z. Execution of Lvov Professors [Każń profesorów lwowskich]. Lipiec 1941. Studia oraz relacje i dokumenty. Wrocław University Press, Wrocław, Poland, 1989, 1–382.
- [10] Born E. [Gerhard Sponholz April 14, 1896–Dec. 29, 1964]. Verh Dtsch Ges Pathol, 1965, 49:403–404.
- [11] Waga T. The history of the Polish dukes and kings briefly collected: with some remarks on the history of Polish nation [Historia xiążąt y królów polskich krótko zebrana: z niektórymi uwagami nad dziejami narodu polskiego]. Piarists' Printing House, Warsaw, Poland, 1803, 1–347, <http://bc.wbp.lublin.pl/dlibra/docmetadata?id=11242&from=pubindex&dirids=1&lp=1861>.
- [12] Reddaway WF, Penson JH, Halecki O, Dyboski R (eds). The Cambridge History of Poland: from Augustus II to Piłsudski (1697–1935). Cambridge University Press, Cambridge, UK, 2017, 1–472.
- [13] Habsburg L (Leopoldus I). *Aurea Bulla Foundationis Universitatis Leopoldinae Wratislaviensis*. Vienna, Austria, 1702, <http://www.bibliotekacyfrowa.pl/dlibra/publication/2903/edition/5316/content?ref=desc>.
- [14] Kozuszek W. History of the Faculty of Medicine and Pharmacy of the University of Wrocław and the Medical Academy in Wrocław in the years 1702–2002 [Historia Wydziałów Lekarskiego i Farmaceutycznego Uniwersytetu Wrocławskiego oraz Akademii Medycznej we Wrocławiu w latach 1702–2002; Geschichte der Medizinischen und Pharmazeutischen Fakultäten der Universität Breslau sowie der Medizinischen Akademie in Wrocław in den Jahren 1702–2002]. Wrocław University Press, Wrocław, Poland, 2002, 1–419.
- [15] Albert Z. Pathological anatomy – according to Lectures [Anatomia patologiczna. Według wykładów. Część Ogólna]. General Part, edited by B. Gago, corrected by K. Mędraś. Publishing Section of the Medical Students' Circle, Wrocław, Poland, 1948, 1–120.
- [16] Albert Z. Anatomic-pathological preparations of cases of malignant hepatoma [Preparaty anatomiczno-patologiczne przypadków wątrobiaka złośliwego]. Pol Gaz Lek, 1938, 17:348.
- [17] Albert Z. A contribution to the texture and behavior of malignant tumors of pituitary gland [Przyczynek do utkania i zachowania się złośliwych guzów przysadki mózgowej]. Pol Gaz Lek, 1937, 16:677–680.
- [18] Albert Z. A rare case of numerous, giant caseous tuberculous tumors of brain [Rzadki przypadek mnogich, olbrzymich serowatych guzów gruźliczych mózgu]. Pol Gaz Lek, 1939, 18:351–352.
- [19] Albert Z. Perforations of tuberculous bowel ulcers [Przebiecia gruźliczych wrzodów jelita]. Przegl Lek, 1946, 2:515–521.
- [20] Albert Z. The topography of anatomo-pathological changes in the stomach, duodenum, gall bladder, liver and pancreas in the spread of colon bacilli in these organs [Stosunek zmian anatomo-patologicznych żołądka, dwunastnicy, woreczka żółciowego, wątroby i trzustki do rozprzestrzeniania się pałeczek okrężnicy w tych narządach]. Przegl Lek, 1947, 3:833–839.
- [21] Albert Z, Moszkowska I. The case of gangrenous appendicitis with perforation and liver abscesses caused by *Pseudomonas aeruginosa* in a few-week-old infant [Przypadek zgorzeliowego zapalenia robaczkowego z przebieciem i ropniami przerzutowymi wątroby wywołanymi pałeczką ropy błękitnej u kilkutygodniowego oseska]. Przegl Lek, 1947, 3:557–560.
- [22] Albert Z. Determination of gender in case of hermaphrodite [W sprawie ustalenia płci obojniaka]. Pol Gaz Lek, 1937, 16:411–413.
- [23] Albert Z. [Giant cell tumor of the sphenoid bone]. Przegl Lek, 1952, 8(9):247–251.
- [24] Albert Z. A huge cysticercus of *Taenia solium vel soliter* [Wielki bąblowiec tasiemca samotnego]. Pol Gaz Lek, 1936, 15:737–738.
- [25] Albert Z. Anatomic-pathological preparations of the case in which two distinct colon cancers coexisted (conventional adenocarcinoma of sigmoid and gelatinous mucinous adenocarcinoma of caecum) [Preparaty anatomiczno-patologiczne przypadku w którym współistniały dwa różne raki jelita grubego (*adenocarcinoma simplex* esicy i rak gruczolowy śluzowaciejący kątnicy)]. Pol Gaz Lek, 1938, 17:348.

- [26] Kossowski S, Albert Z. [So-called *granuloma gangraenescens*]. Pol Tyg Lek, 1959, 14:21–25.
- [27] Albert Z. Lesions of main artery in children and their relationship to atherosclerosis [Zmiany tętnicy głównej u dzieci i ich stosunek do miażdżycy]. Pol Gaz Lek, 1938, 17:353–357.
- [28] Albert Z. Myocardial changes in children in acute and chronic diseases [Zmiany mięśnia sercowego u dzieci w chorobach ostrych i przewlekłych]. Now Lek, 1938, 50:565–572, 619–623.
- [29] Albert Z. Myocardial changes in diseases with convulsive and manic disorders, with particular emphasis on fragmentation [Zmiany mięśnia sercowego w chorobach ze stanami drgawkowymi i szalowymi ze szczególnym uwzględnieniem fragmentacji]. Pol Gaz Lek, 1939, 18:418–422.
- [30] Albert Z. In case of *in vivo* occurrence of myocardial fragmentation [W sprawie zażyciowego powstawania fragmentacji mięśnia sercowego]. Przegl Lek, 1947, 3:201–202.
- [31] Albert Z. Ziarnica lipidowa (Lipoid granulomatosis, Morbus Hand-Schüller-Christiani. *Reticuloendotheliosis cholesterolica*) [Lipid granulomatosis of a child (lipoid granulomatosis in nomenclature at the time) in course of Hand-Schüller-Christian disease]. Pol Tyg Lek, 1947, 2:853–862.
- [32] Albert Z. The issue of the etiology of multiple subcutaneous lipomas and their relation to multiple neurofibromas [Zagadnienie etiologii mnogich tłuszczaków podskórnych i ich stosunek do mnogich nerwiakówłókniaków]. Pat Pol, 1950, 1:7–18.
- [33] Albert Z. Liposarcoma (lipoblastosarcoma) of the breast in a man [Tłuszczakomięsak (lipoblastosarcoma) gruczołu piersiowego u mężczyzny]. Przegl Lek, 1947, 3:134–138.
- [34] Albert Z, Medras K. [Morphology of ovarian tumors in mice following single Roentgen-irradiation]. Arch Immunol Ther Exp (Warsz), 1955, 3:27–40.
- [35] Bross W, Albert Z, Kustrzycki A. [Biopsies of the lung & atrial appendages in mitral stenosis & their prognostic value]. Minerva Med, 1958, 49(53):2658–2660.
- [36] Albert Z, Czyżewski K, Szepietowski T. [Microscopic and functional changes of the liver in gastric and duodenal ulcer]. Patol Pol, 1964, 15:301–311.
- [37] Albert Z, Czyżewski K, Kawecki K, Szepietowski T. [Microscopic and functional liver changes in cholelithiasis]. Patol Pol, 1967, 18(3):359–369.
- [38] Albert Z, Orlowski M, Szewczuk A. Histochemical demonstration of gamma-glutamyl transpeptidase. Nature, 1961, 191(4790):767–768.
- [39] Albert Z, Orlowska J, Orlowski M, Szewczuk A. Histochemical and biochemical investigations of gamma-glutamyl transpeptidase in the tissues of man and laboratory rodents. Acta Histochem, 1964, 18:78–89.
- [40] Albert Z, Orlowska J, Orlowski M. Histochemical and biochemical investigations of gamma-glutamyl transpeptidase in renal cancer of man. Acta Histochem, 1964, 18:90–94.
- [41] Albert Z. Gamma-glutamyl transpeptidase in cancers of different human organs. Nature, 1965, 205:407.
- [42] Albert Z, Orlowski M, Rzućidło Z, Orlowska J. Studies on gamma-glutamyl transpeptidase activity and its histochemical localization in the central nervous system of man and different animal species. Acta Histochem, 1966, 25(5):312–320.
- [43] Szewczuk A, Milnerowicz H, Albert Z, Richter R. Gamma-glutamyltransferase in Morris hepatomas 5123D passaged in Buffalo and in F1 (Buffalo × Wistar) rats. Neoplasma, 1980, 27(3):241–245.
- [44] Szewczuk A, Milnerowicz H, Prusak E, Albert Z. Light form of Morris hepatoma gamma-glutamyltransferase. Folia Histochem Cytochem (Krakow), 1982, 20(1–2):25–33.
- [45] Albert Z, Szewczuk A, Albert W. Effect of passages of Morris hepatoma 5123D in F1 (Buffalo × Wistar) rats on permanent decrease of gamma-glutamyltranspeptidase activity. Neoplasma, 1977, 24(1):49–55.
- [46] Albert Z, Szewczuk A, Mulczyk M. Histochemical and biochemical studies of glycyl peptidase and glycyl arylamidase. Acta Histochem, 1971, 39(1):118–124.
- [47] Albert Z, Szewczuk A. Histochemical and biochemical studies on Co++-activated acylase in rodent tissues. Acta Histochem, 1972, 42(1):68–76.
- [48] Albert Z, Szewczuk A. Pyrrolidonyl peptidase in some avian and rodent tissues. Histochemical localization and biochemical studies. Acta Histochem, 1972, 44(1):98–105.
- [49] Szewczuk A, Albert Z. Activity of some hydrolases in animals with transplanted and spontaneous tumours. Folia Histochem Cytochem (Krakow), 1973, 11(2):75–82.
- [50] Albert Z, Balbierz H, Bręborowicz J, Harłodzińska A, Lisowska E, Łucka B, Majewski P, Richter R, Russin K, Siuda A, Zawadzka H. Reagents for radioimmunological determination of carcinoembryonic antigen (CEA). Arch Immunol Ther Exp (Warsz), 1978, 26(1–6):227–229.
- [51] Zawadzka H, Lisowska E, Harłodzińska A, Albert Z, Richter R, Janusz M. Differences in the purification effect of carcinoembryonic antigen (CEA) from the three different hepatic metastases of rectum carcinoma. Neoplasma, 1979, 26(2):157–167.
- [52] Harłodzińska A, Albert W, Rogalski E, Richter R, Albert Z. CEA-like antigens in different histologic types of human lung carcinoma. Neoplasma, 1979, 26(2):145–156.
- [53] Harłodzińska A, Richter R, Albert Z, Zawadzka H. Antigenic heterogeneity of human lung cancers. J Natl Cancer Inst, 1983, 70(3):427–433.
- [54] Kula J, Harłodzińska A, Richter R, Albert Z, Sward J, Gawlikowski W. Carcinoembryonic antigen in gynecologic cancers. Immunohistochemical localization and serum levels. Tumori, 1983, 69(1):23–30.
- [55] Michalak T, Krawczyński K, Harłodzińska A, Potomski J, Albert Z. Localization of carcinoembryonic antigen in mesenteric lymph nodes of patients with gastrointestinal cancer. Neoplasma, 1983, 30(1):67–72.
- [56] Albert Z. [Danger of inducing cancer with food stuff dyes]. Pol Tyg Lek (Warsz), 1957, 12(5):161–165.
- [57] Albert Z, Brojakowska M. [Effect of prolonged administration of nitrogranulogen on spontaneous appearance of neoplasms in mice]. Patol Pol, 1952, 3(4):309–316.
- [58] Albert Z, Brojakowska M. [Effect of prolonged diet with red prontosil on changes in the internal organs with special reference to kidneys]. Patol Pol, 1953, 4(1):35–49.
- [59] Albert Z. [Effect of prolonged administration of red prontosil on growth of transplantable Crocker's sarcoma in mice]. Patol Pol, 1953, 4(3):169–173.
- [60] Albert Z. [Production of pulmonary adenomas in mice with prolonged feeding of red prontosil]. Patol Pol, 1955, 6(2):77–81.
- [61] Albert Z. [Effect of prolonged feeding with chrysoidine on production of hepatic adenoma and cancer in mice]. Pol Tyg Lek, 1954, 9:1565–1566.
- [62] Albert Z. [Effect of prolonged feeding with chrysoidine on the formation of adenoma and cancer of liver in mice]. Arch Immunol Ther Exp (Warsz), 1956, 4:189–242.
- [63] Albert Z, Orlowski M. Some peculiar biological and biochemical properties of a mouse hepatoma induced by chrysoidine. II. Metabolic properties of the hepatoma. J Natl Cancer Inst, 1960, 25:455–460.
- [64] Albert Z, Orlowski M. Some peculiar biological and biochemical properties of a mouse hepatoma induced by chrysoidine. III. Activity of glucose-6-phosphatase. J Natl Cancer Inst, 1960, 25:461–464.
- [65] Metzger M, Albert Z. Some peculiar biological and biochemical properties of a mouse hepatoma induced by chrysoidine. IV. Lysozyme activity of extracts of organs of hepatoma-bearing animals. Arch Immunol Ther Exp (Warsz), 1965, 1:43–45.
- [66] Djaczenko W, Albert Z. Ultrastructure of chrysoidin-induced hepatoma. Acta Med Pol, 1962, 3:307–321.
- [67] Mędraś K. Presence and distribution of free porphyrins in transplants of a chrysoidin-induced mouse hepatoma. J Natl Cancer Inst, 1960, 25(3):465–472.
- [68] Albert Z, Kustrzycki A, Rzućidło Z. Angiography of afferent and efferent blood vessels in transplantable chrysoidin hepatoma in mice. Acta Med Pol, 1963, 4:21–31.
- [69] Albert Z. The behaviour of Crocker's sarcoma grafted upon transplantable chrysoidin hepatoma and spontaneous mammary carcinoma of mice. Acta Med Pol, 1962, 3:33–39.
- [70] Albert Z, Starzyk H. [Behavior of 2 different neighboring tumors induced by methylcholanthrene in mice]. Patol Pol, 1967, 18(2):221–229.
- [71] Albert Z, Harłodzińska A, Richter R, Salwa J, Singer Z. Immunologic response in patients to cells of their own tumor. Arch Immunol Ther Exp (Warsz), 1971, 19(4):455–463.
- [72] Harłodzińska A, Albert Z, Richter R, Singer Z, Salwa J. Humoral cross immunity in patients with malignant tumors. Arch Immunol Ther Exp (Warsz), 1971, 19(6):835–849.

- [73] Harłonińska A, Glazman H, Woźniowski A, Albert Z, Richter R. Introductory immunologic studies on human gastrointestinal tract tumors. *Arch Immunol Ther Exp (Warsz)*, 1973, 21(6): 849–861.
- [74] Albert Z. [Bee's venom in experimental studies of neoplasms]. *Patol Pol*, 1952, 3(2):108–111.
- [75] Albert Z, Brojakowska M. [Induction of neoplasms in mice by injection of human tissue extracts]. *Patol Pol*, 1952, 3(3): 207–216.
- [76] Albert Z. [Transplantation of human and murine neoplasms into the anterior chamber of the eye in guinea pigs and rabbits]. *Patol Pol*, 1954, 5(2):111–115.
- [77] Harłonińska A, Kotlarek-Haus S, Richter R, Albert Z, Skriabin A, Brodzka W, Gasiorowski K. [Transplantable hamster sarcoma induced by cells from human culture]. *Patol Pol*, 1977, 28(1): 61–74.
- [78] Albert Z, Medras K, Gorska I. Further studies on the effect of environment on the development of spontaneous mammary cancer and malignant mesenchymal tumors in mice. *Acta Med Pol*, 1962, 3:131–136.
- [79] Albert Z. [Doc. Dr. Kazimierz Medraś]. *Patol Pol*, 1971, 22(1): 1–6.
- [80] Albert Z. Prof. dr med. Tadeusz Ostrowski. Wrocław Polish Biographical Dictionary, 1979, 24:576–578.
- [81] Albert Z. Prof. Dr. Med. Witold Nowicki in eight anniversary of his death [Prof. dr. med. Witold Nowicki w 8 rocznicę śmierci]. *Pat Pol*, 1950, 1:93–95.
- [82] Wincewicz A, Szepietowska A, Sulkowski S. Professor Witold Nowicki – a greatly spirited pathologist. *Pol J Pathol*, 2016, 67(2):102–107.
- [83] Albert Z. Professor Jakub Karol Parnas in Lvov in 1944 (based on self-made records during the war) [Prof. Jakub Karol Parnas we Lwowie w roku 1944 (na podstawie zapisków dokonanych w czasie wojny)]. *Arch Hist Filoz Med*, 1993, 56:385–391.
- [84] Albert Z. Chair and Department of Pathological Anatomy, Medical Academy of Wrocław [Katedra i Zakład Anatomii Patologicznej, Akademia Medyczna we Wrocławiu]. Wrocław, 1970, 41–42, 119–125; Wrocław, 1975, 131–137.
- [85] Albert Z. Letter to the Editor. Comment to the work of Prof. Witold Ziembicki titled: "A Department of the History of Medicine in Lvov. Chronicle of 1942–1944". *Arch Hist Filoz Med*, 1982, 45:111–114.
- [86] Albert Z. Pathological anatomy in Lvov in the eighteenth to twentieth century [Anatomia patologiczna we Lwowie w XVIII–XX wieku]. *Arch Hist Filoz Med*, 1993, 56:229–251.
- [87] Albert Z. Helena Schuster (1884–1947), Associate Professor of the Department of Pathological Anatomy of the UJK in Lvov. *Arch Hist Filoz Med*, 1993, 56:165–168.
- [88] Albert Z. Professor Dr Paweł Ludwik Kucera (1872–1928) – Head of the UJK Institute of Hygiene in Lvov (1906–1919). *Arch Hist Filoz Med*, 1992, 55:63–71.
- [89] Albert Z. Prof. Dr Andrzej Obrzut (1854–1910). *Arch Hist Filoz Med*, 1992, 55:55–62.
- [90] Zerbino D, Volos LI. Professor Andrew Obrzut – the first Head of the Pathological Anatomy Department (1896–1910) of the Medical Faculty of Jan Casimir University in Lviv. *Pol J Pathol*, 2018, 69(2):182–184.
- [91] Lanckorońska K. Michelangelo in Ravensbrück: one woman's war against the Nazis. Da Capo Press, Perseus Books Group, Cambridge, MA, USA, 2008, 1–372.
- [92] Wincewicz A, Woltanowski P, Sulkowski S. Heritage of Stanisław Ciechanowski (1869–1945) – discoverer of pathogenesis of prostatic hyperplasia – *passionis insignia signis fulgent mirificis*. *Prostate*, 2018, 78(12):938–948.
- [93] Lemkin R. Axis rule in occupied Europe: laws of occupation, analysis of government, proposals for redress. 2nd edition, Foundations of the Laws of War, The Lawbook Exchange, Ltd., New York, 2008, 1–712.
- [94] Jacobs SL. Genesis of the concept of genocide according to its author from the original sources. *Hum Rights Rev*, 2002, 3(2):98–103.
- [95] Vrdoljak AF. Human rights and genocide: the work of Lauterpacht and Lemkin in modern international law. *Eur J Int Law*, 2009, 20(4):1163–1194.
- [96] Schabas WA. The UN International Criminal Tribunals. The former Yugoslavia, Rwanda and Sierra Leone. Cambridge University Press, Cambridge, 2006, 1–766.
- [97] Martin M, Fangerau H, Karenberg A. German neurology and the 'Third Reich'. *Eur Neurol*, 2016, 76(5–6):234–243.
- [98] Gross D, Kaiser S, Sziranyi J. "... a life broken in two" Walter Pagel (1898–1983) – famous pathologist and victim of Nazi Germany. *Pathol Res Pract*, 2019, 215(3):611–618.
- [99] Groß D, Schmidt M, Sziranyi J. [The double exclusion of the pathologist and Nazi victim Paul Kimmelstiel (1900–1970). German version]. *Pathologe*, 2019, 40(3):301–312.
- [100] Ziolkowski P, Symonowicz K, Chmielewski P, Latos-Grazyński L, Streckyte G, Rotomskis R, Rabczyński J. New potent sensitizers for photodynamic therapy: 21-oxaporphyrin, 21-thiaporphyrin and 21,23-dithiaporphyrin induce extensive tumor necrosis. *J Cancer Res Clin Oncol*, 1999, 125(10):563–568.
- [101] Ziolkowski P, Symonowicz K, Milach J, Zawirska B, Szkudlarek T. *In vivo* tumor necrosis factor- α induction following chlorin e6-photodynamic therapy in Buffalo rats. *Neoplasma*, 1997, 44(3):192–196.
- [102] Kozuszek W. Jan Mikulicz-Radecki 1850–1905. Co-creator of modern surgery [Jan Mikulicz-Radecki 1850–1905. Współtwórca nowoczesnej chirurgii: Johann Mikulicz-Radecki (1850–1905); Mitbegründer der modernen Chirurgie]. Wrocław University Press (Wydawnictwo Uniwersytetu Wrocławskiego), Wrocław, Poland, 2005, 1–279.
- [103] Swafford J. Johannes Brahms: a biography. Vintage, New York, USA, 1999, 1–752.
- [104] Bârsu C. Morphological and immuno-clinical researches during the first half of the 20th century in Cluj, Romania. Overview of the experiments done by Iuliu Moldovan. *Rom J Morphol Embryol*, 2015, 56(3):1233–1237.
- [105] Tafuri M. Interpreting the Renaissance: princes, cities, architects. Harvard University Graduate School of Design, Yale University Press, New Haven, USA, 2006, 1–568.

Corresponding author

Andrzej Wincewicz, Associate Professor, MD, PhD, Fellow of European Board of Pathology (FEBP), Professor of UJK in the years 2013–2016, Specialist Medical Practice – Pathologist, Non Public Health Care Unit, Department of Pathology (NZOZ Zakład Patologii Spółka z o.o.), ul. Jagiellońska 70, 25–734 Kielce, Poland; Phone +48 41 368 47 87, Fax +48 41 366 17 81, e-mails: ruahpolin@yahoo.com, andwinc@gmail.com