

ИСТОРИЈА МЕДИЦИНЕ / HISTORY OF MEDICINE

Professor Liberato J. A. DiDio – a great anatomist of the 20th century and an advocate of medicine without borders

Gordana Teofilovski-Parapid¹, Maria A. Miglino²¹University of Belgrade, Faculty of Medicine, Belgrade, Serbia;²University of Sao Paulo, School of Veterinary Medicine and Animal Science, Sao Paulo, Brazil**SUMMARY**

Liberato J. A. DiDio (1920–2004) was one of the most prominent figures of anatomy belonging to the 20th century's second half and an open-minded man. In 1984, during the era of communism in Yugoslavia, he opened the doors of the Medical College of Ohio (MCO) in Toledo, OH, USA, to a Serbian doctor. During the troubled times for people and anatomists in Serbia in 1994, he saved their association from being expelled from the International Federation of Anatomical Associations. In 1999, only a few months after the bombing of Yugoslavia, he helped them to get the organization of the XVIII International Symposium on Morphological Sciences in 2005, the meeting of the leaders in the field. Serbian anatomists and clinicians proved that he was right when considering them on a par with their peers in the international anatomical and medical community.

Professor DiDio first showed talent with Gold Medal – top graduate at his high school, and La Royale Award (Graduation Golden Ring) – top graduate MD. He was trained in Brazil, Italy, and the US. He was the Founding Chairman – Department of Topographical Anatomy, Faculdade de Ciências Médicas, Belo Horizonte, Minas Gerais, Brazil; Head of Gross and Surgical Anatomy, Northwestern University Medical, Dental, and Graduate Schools; Founding Chairman, Department of Anatomy, MCO; Professor Emeritus at the age of 70 (1990), Assistant to the President of the MCO, Consultant to the President and the Emeritus Dean (1992–2004). He was a member of editorial boards of 34 journals, academic adviser in 92 M.S. and Ph.D. theses.

Keywords: Professor Liberato J. A. DiDio; anatomy; morphology; XVIII International Symposium on Morphological Sciences – Belgrade 2005

Liberato John Alphonse DiDio (1920–2004) was one of the most prominent figures of anatomy belonging to the second half of the 20th century. He was a great scientist and an open-minded man who, in 1984, during the communist era in Yugoslavia, generously opened the doors of the Medical College of Ohio in Toledo, OH, USA, to a Serbian anatomist. And these doors remained open for collaboration and support [1–5]. Moreover, during the tumultuous and troubled times for anatomists in Serbia in 1994, he saved their association from being expelled from the International Federation of Anatomical Associations (IFAA). However, this was not the end of his generosity. In 1999, only a few months after the bombing of the Federal Republic of Yugoslavia, during the Congress of the IFAA in Rome, he helped them and the Faculty of Medicine of the University of Belgrade to get the organization of the XVIII International Symposium on Morphological Sciences (ISMS) in 2005, the meeting of the leaders in the field, which was an honor and a privilege never before bestowed on anatomists of the entire former Yugoslavia (Figure 1). That scientific and moral giant had an extremely rich and fruitful history.

Liberato J. A. DiDio was born in 1920 to an Italian family living in Brazil. Early in his

life, it became obvious he was exceptional as he got the Gold Medal as the top graduate of his high school (Instituto Pratola, Sao Paulo, Brasil, 1931), followed by the Certificate of Honor, as the top student at the end of his gymnasium education (Dante Alighieri College, Sao Paulo, 1936). Over the six-year medical school course (1940–1945), he was the annual laureate of the Montenegro Award as the leading student, and, finally, he was awarded the La Royale Award (Graduation Golden Ring) at the graduation ceremony as the best M.D. (Faculdade de Medicina, University of Sao Paulo, 1945). Even at that young age, his talent and hard work were internationally recognized and rewarded by the Rockefeller Foundation Award as the top student in basic medical sciences (1945). The aforementioned awards are but a few from a long list of 144 awards he received during his long and fruitful life.

Professor DiDio had a fascinating and rich educational background and training. First, in Brazil at the Faculty of Medicine of the University of Sao Paulo, from which he obtained the M.D. degree (1945) and the D.Sc. degree (1949), and had the postdoctoral training in embryology, postdoctoral course in labor medicine and forensic/medico-legal aspects, Ph.D.

**Received • Примљено:**

June 14, 2018

Accepted • Прихваћено:

June 20, 2018

Online first: June 22, 2018**Correspondence to:**

Gordana TEOFILOVSKI-PARAPID
University of Belgrade
Faculty of Medicine
Dr. Subotića starijeg 8
11000 Belgrade, Serbia
gordana.teofilovski-parapid@med.bg.ac.rs

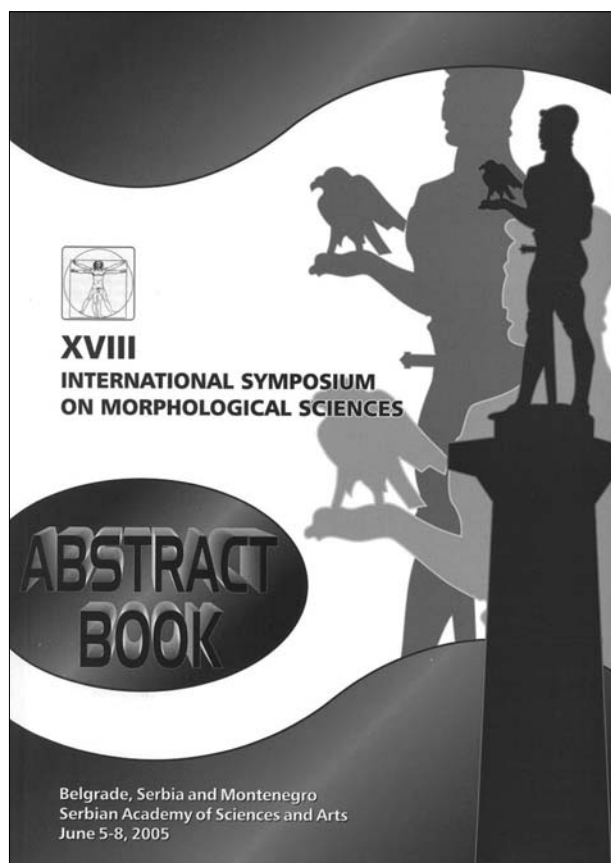


Figure 1. Abstract Book of the XVIII International Symposium on Morphological Sciences held in the Belgrade in the Serbian Academy of Sciences and Arts, June 5–8, 2005

in anatomy (*Summa cum laude*). At the University Hospital of the same school, he accomplished his internship in tropical medicine, and residency in surgery. Finally, he got the chairmanship in Anatomy and Embryology, by competitive examinations (*Summa cum laude*) at the Faculty of Medicine, Federal University of Minas Gerais, Belo Horizonte, Brazil. The need to broaden his scientific horizons and improve his skills took him out of Brazil. Hence, in 1955, he pursued his postdoctoral training in caryometry and histophotometry at the Messina University, Italy, and postdoctoral training in lymphology at the Parma University, Italy, in 1958. The crown of his education was the two-year fellowship (1961–1962) in the US with postdoctoral training in electron microscopy, polarization microscopy, and study of medical education in the following institutions: Department of Anatomy at the School of Medicine of the University of Washington, Seattle, WA; Department of Cytology at the Rockefeller University, New York City, NY; and at the Department of Anatomy of the Harvard University Medical School, Boston, MA.

The long list of his appointments begins with the position of the Research Assistant in Physiology at the Faculty of Medicine of the University of Sao Paulo (1942–1944), followed by the Research Assistant and Instructor (monitor) in Anatomy I (1943–1946). He left the School in 1954, as Associate Professor of Anatomy, to become Professor and Founding Chairman at the Department of Topographical Anatomy of the Faculdade de Ciências Médicas in Belo Horizonte, Minas Gerais, Brazil, where he stayed as Professor and Chairman until 1963. While at the University of Minas Gerais in Belo Horizonte, he also worked



Figure 2. The last meeting of professor and his alumna – Professor Liberato J. A. DiDio with professors (left to right) Gordana Teofilovski-Parapid, Carlos Baptista, and Angelica Miglino (State University of Rio de Janeiro, July 2002)

as Professor and Chairman at the Department of Veterinary Anatomy (1955–1956) and Director of the Institute of Morphology (Anatomy, Histology, Embryology, Electron Microscopy, Neuroanatomy) (1962–1963).

At the age of 43, he definitely moved to the US, where he continued adding prestigious titles and positions to his academic career: Professor, Head of Gross Anatomy and Surgical Anatomy, Department of Anatomy, Northwestern University Medical, Dental, and Graduate Schools, Chicago, IL (1963–1966); Professor and Founding Chairman, Department of Anatomy, Medical College of Ohio (MCO) in Toledo, OH (first founding faculty member) (1966–1988); Founding Dean of the Graduate School (1972–1986). Although recognized as Professor Emeritus at the age of 70 (1990), this didn't stop him from working at the MCO as the Assistant to the President (1988–1991), Interim Director of the Mulford Library (1990–1991), Consultant to the President and the Emeritus Dean (1992–2004). He kept his international scientific activities as Visiting Professor at the Institute of Human Normal Anatomy of the La Sapienza University in Rome, Italy, as well as at the Department of Morphology of the Escola Paulista de Medicina, Federal University of Sao Paulo, Brazil, and as President of the Committee on Ethics in Scientific Research at the University of Santo Amaro, Sao Paulo, Brazil (Figure 2).

Dr. DiDio died in Sao Paulo (2004) as the Emeritus Dean of the MCO. At the time, he was performing several additional duties in Brazil: he was the Advisor for Graduate Studies at the Department of Surgery and Anatomy of Domestic Animals of the Faculty of Veterinary Medicine and Zootechnology, University of Sao Paulo, Vice-President of the Organizacao Santamarensense de Educacao e Cultura, as well as Professor of Surgical Anatomy at the Department of Surgery, and of Scientific Methodology at the Department of Public Health (Faculty of Medicine), Professor of Veterinary Anatomy at the Faculty of Veterinary Medicine of the University of Santo Amaro, Sao Paulo, Brazil.

He left behind a legacy of 11 books as either the only or the first author, another 20 with chapters written by him, 379 scientific papers, and over 177 papers reported at morphological meetings worldwide. He reviewed 15 international books and translated another 11, which was possible due to his knowledge of English, Italian, Portuguese, French, and Spanish. He was an academic adviser in 92 M.S. and Ph.D. theses.

It is hard to find a system of the human body to whose anatomy data Professor DiDio has not contributed [1–24]. In his huge scientific body of work, he dealt with coronary circulation describing cardiac segments and subsegments



Figure 3. Professor David Brynmor Thomas (President of the International Federation of Anatomical Associations, IFAA, at the time) with professors (left to right): Beverly Kramer (current IFAA President), G. Strkalj (South Africa), Lev Kolesnikov (President of the All-Russian Scientific Society of Anatomists, Histologists and Embryologists), Mauricio Moscovici (Honorary Vice-President, International Committee of Symposia on Morphological Sciences) with wife Fella Moscovici (Belgrade City Hall, Opening Ceremony of the XVIII International Symposium on Morphological Sciences, June 5, 2005)

in humans and their importance for cardiac surgery, electron microscopic investigations on the myocardium under normal, experimental, and pathologic conditions, as well as cardiac valve bioprotheses in humans [3, 5–10]. The research comprises the anatomical and experimental investigations on anatomicosurgical segmentectomy in dogs and its application in human cardiac surgery. Furthermore, he conducted the research on anatomicosurgical segments of organs other than the heart, in both humans and other mammals [11, 12, 13]. His most recent research was related to several projects, such as aging, subcellular structure of the normal and neoplastic prostate, placenta of mammals, pineal gland, subcellular alterations induced by amiodarone, and innervations of muscles of the arm and their relationship with rehabilitation chronology [14–24].

Dr. DiDio was a member of editorial boards of 34 prestigious scientific journals in the field at the time, such as *Acta Anatomica* (Switzerland), *Anatomia Clinica* – now *Surgical and Radiological Anatomy* (France and Germany), *Anatomischer Anzeiger* – now *Annals of Anatomy* (Germany), *Archivio Italiano di Anatomia ed Embriologia* (Italy), *Bulletin de l'Association des Anatomistes* (France), *Excerpta Medica* (Anatomy, Histology, Embryology, Anthropology) (the Netherlands), *Morphology Journal* (Russia), *Ohio Journal of Science* (USA), *Brazilian Journal of Morphological Sciences* (Brazil), *Revista Chilena de Anatomia* (Chile), etc.

Throughout the world, scientific and professional associations were eager to have Dr. DiDio as a member and 55 succeeded in that effort. He was a prominent member of the American Association of Anatomists, American Association of University Professors, American Association of Veterinary Anatomists, American Cancer Society, American College of Legal Medicine, American Heart Association, International College of Surgeons (Fellow), Anatomical Society of Great Britain and Ireland, Anatomische Gesellschaft, Associacao Brasileira de Editores Cientificos, Associacao Medica do Parana, Portuguese Anatomical Society, Societe d'Anthropologie de Paris, etc. He was a founder of the American Association for Cell Biology, Ibero-American Society of Anatomy, Italian Society of Histochemistry, and Pan American Association of Anatomy. In the International Federation of Associations of Anatomists, Dr. DiDio served as the President (1986–1989), and afterwards as the Honorary President. He died as the President of the International Committee on Symposia on Morphological Sciences, generously helping in organizing the XVIII ISMS, to be held in Belgrade, Serbia, on June 5–8, 2005.

Dr. DiDio will be remembered as a man with immense knowledge that made him define the importance of the concept of “dynamic morphology” as an integration of

structure and function. He will be remembered as a medical doctor and a scientist of great moral integrity, a demanding advisor, but nonetheless a supportive professor and a devoted friend – all at the same time (Figure 2). The 21st century anatomy – without him – will never be the same, for, among other things, Serbian anatomists and the Serbian Medical Society lost a selfless supporter and a faithful friend in the international medical science community. However, by successfully organizing the XVIII ISMS held in Belgrade, Serbia, on June 5–8, 2005, Serbian anatomists and clinicians side by side – strongly supported by the Faculty of Medicine of the University of Belgrade, the Board for Cardiovascular Pathology of the Serbian Academy of Sciences and Arts (SASA) and its president Academician Vladimir Kanjuh, and the authorities of the Republic of Serbia – all united, lived up to Professor DiDio's expectations, proving he was right when considering them on a par with their international peers in the world of anatomical and medical society [25]. That meeting, after 10 years of sanctions, brought to the SASA for the first time over 100 foreign scientist, among whom Professor David Brynmor Thomas (Figure 3) and Professor Pierre Sprumont, presidents of the IFAA and the European Federation For Experimental Morphology (EFEM), respectively. They both held their associations' council meetings in Belgrade during the XVIII ISMS. Even nowadays, you will find “Belgrade 2005” in the EFEM Statute [26]. Our leading clinicians at the Faculty of Medicine of the University of Belgrade and affiliated hospitals adopted the concept of dynamic morphology and helped anatomists in creating an exceptional program. Today, many of them are members of the SASA, like professors Nebojša Radunović, Miodrag Ostojić, Đorđe Radak, Nebojša Lalić, Petar Seferović, Marko Bumbaširević, and other equally prominent ones, like professors Biljana Obrenović-Kirćanski, Nadežda Čovičković-Šternić, Miodrag Rakić, Mirko Teofilovski, and Mladen Kočica. The Serbian Medical Society showed its best, and our international colleagues have been fascinated.

ACKNOWLEDGEMENT

This text was partly reported at the XVIII International Symposium on Morphological Sciences in Belgrade, June 2–5, 2005.

Authors are indebted to the Ministry of Science and Environment Protection of the Republic of Serbia and to the Malpighi Foundation (Italy) for the financial support of the XVIII ISMS, and especially to Professor Guido Macchiarelli for his personal contribution. This work has been supported by the Ministry of Education and Sciences of the Republic of Serbia, grant No. III41022.

REFERENCES

- Baptista CA, DiDio LJ, Teofilovski-Parapid G. Variation in length and termination of the ramus circumflexus of the human left coronary artery. *Anat Anz.* 1990; 171(4):247–53.
- DiDio LJ, Baptista CA, Teofilovski-Parapid G. Anatomical variations of the abducent nerve in humans. *Arch Ital Anat Embriol.* 1990; 95(3-4):167–72.
- Teofilovski-Parapid G, Baptista CA, DiDio LJ, Vaughan C. The membranous portion of the interventricular septum and its relationship with the aortic valve in humans. *Surg Radiol Anat.* 1991; 13(1):23–8.
- Baptista CA, Didio LJ, Teofilovski-Parapid G. Variations of the blood supply of the human conus arteriosus. *Bull Assoc Anat (Nancy).* 1992; 76(232):9–18.
- Teofilovski G, Filipovic B, Bogdanovic D, Trpinac D, Rankovic A, Stankovic G, et al. Myocardial bridges over coronary arteries in Cercopithecus. *Ann Anat.* 1992; 174(5):435–9.
- Piras C, Rodrigues H, Lopes AC, DiDio LJ. The relationship between the papillary muscles and the anatomical segments of the left ventricle of the human heart. *Rev Assoc Med Bras (1992).* 1993; 39(3):135–40.
- DiDio LJ. Electron microscopic and x-ray microanalytic evaluation of cardiac valve bioprostheses. *Tokai J Exp Clin Med.* 1983; 8(4):301–6.
- Fentie IH, Allen DJ, Schenck MH, Didio LJ. Comparative electron microscopic study of bovine, porcine and human parietal pericardium, as materials for cardiac valve bioprostheses. *J Submicrosc Cytol.* 1986; 18(1):53–65.
- Macchiarelli G, DiDio LJ, Allen DJ, Stolf NG, Pego-Fernandes P, Motta PM. Scanning electron microscopy study of endocardial regeneration in bovine pericardial patch-grafts implanted in the canine heart. *Cardioscience.* 1994; 5(1):43–9.
- Didio LJ, Franco-Saenz R, Morse DE. Endocrine cardiomyocytes. *J Submicrosc Cytol.* 1987; 19(4):683–94.
- Busnardo AC, DiDio LJ, Thomford NR. Anatomical segments of the human pancreas. *Surg Radiol Anat.* 1988; 10(1):77–82.
- Christo MC, DiDio LJ. Anatomical and surgical aspects of splenic segmentectomies. *Ann Anat.* 1997; 179(5):461–74.
- DiDio LJ, Lopes AC. Clinical and surgical importance of anatomical segments and subsegments of the organs of the human body. *Rev Assoc Med Bras (1992).* 1995; 41(3):167–77.
- Lopes AC, DiDio LJ. Positive aspects of geriatrics and gerontology. *Rev Assoc Med Bras (1992).* 1996; 42(1):1.
- Timms BG, Mohs TJ, Didio LJ. Ductal budding and branching patterns in the developing prostate. *J Urol.* 1994; 151(5):1427–32.
- Gross SA, Didio LJ. Comparative morphology of the prostate in adult male and female *Praomys (Mastomys) Natalensis* studied with electron microscopy. *J Submicrosc Cytol.* 1987; 19(1):77–84.
- Gross SA, Didio LJ. The prostate in pregnant and non-pregnant *Praomys (Mastomys) Natalensis* at the subcellular level. *J Submicrosc Cytol Pathol.* 1988; 20(1):101–7.
- Migliano MA, DiDio LJ. Vasculature of bovine placenta studied by scanning electron microscopy of corrosion casts. *Ital J Anat Embryol.* 1992; 97(1):23–35.
- Hamlett WC, Migliano MA, Didio LJ. Subcellular organization of the placenta in the Atlantic sharpnose shark, *Rhizoprionodon terraenovae*. *J Submicrosc Cytol Pathol.* 1993; 25(4):535–45.
- Lopes AC, Mora O, Sasso WS, DiDio LJ. Propranolol-like action of amiodarone. An electronmicroscopic study in rats under cold stress. *J Submicrosc Cytol Pathol.* 1997; 29(2):253–6.
- Cricenti SV, Deangelis MA, Didio LJ, Ebraheim NA, Rupp RE, Didio AS. Innervation of the extensor carpi radialis brevis and supinator muscles: Levels of origin and penetration of these muscular branches from the posterior interosseous nerve. *J Shoulder Elbow Surg.* 1994; 3(6):390–4.
- Sirigu P, Gross SA, DiDio LJ, Lantini MS. Histochemical localization of prostaglandin-synthetase in the salivary glands of *Praomys (Mastomys) natalensis*. *Basic Appl Histochem.* 1988; 32(3):321–5.
- Cramer GD, Allen DJ, DiDio LJ, Potvin W, Brinker R. Comparison of computerized tomography with magnetic resonance imaging (MRI) in the evaluation of encephalic ventricular volume. *Surg Radiol Anat.* 1990; 12(2):135–41.
- Manso JC, DiDio LJ. Anatomical variations of the human suprarenal arteries. *Ann Anat.* 2000; 182(5):483–8.
- XVIII International Symposium on Morphological Sciences, Belgrade June 5–7, 2005. Abstract Book, p. 1–266.
- European Federation for Experimental Morphology (EFEM), <http://www.efem.eu/statutes.php>.

Професор Либерато Џ. А. Дидио – велики анатом двадесетог века и заговорник медицине без граница

Гордана Теофиловски-Парапид¹, Марија А. Миглино²

¹Универзитет у Београду, Медицински факултет, Београд, Србија;

²Универзитет у Сао Паулу, Ветеринарски факултет, Сао Паулу, Бразил

САЖЕТАК

Либерато Џ. А. Дидио (1920–2004) био је један од најеминентнијих анатома друге половине XX века и слободоуман човек. Он је 1984. године, у време комунистичког режима у Југославији, отворио врата Медицинског факултета Охаја (МФО) у Толеду српском доктору и анатому. У тешким временима за народ и анатоме у Србији, он је 1994. спасио њихову асоцијацију од избацивања из Интернационалне федерације анатомских асоцијација (ИФАА) и 1999. само неколико месеци после бомбардовања Србије, за време ИФАА конгреса у Риму, он је помагао њима и Медицинском факултету Универзитета у Београду да добију организацију XVIII Интернационалног симпозијума морфолошких наука 2005. године, састанак светских лидера у морфологији који ни анатоми и бившој Југославији нису добили. Српски анатоми и клиничари су искористили пружену прилику и доказали да је био у праву када их је сматрао равноправним у светској анатомији и медицини.

Професор Дидио је рано показао таленат, почевши Златном медаљом за завршену гимназију и краљевском наградом Дипломски златан прстен за најбоље дипломираног доктора. Изузетно се образовао у родном Бразилу, а затим у Италији и САД. Био је оснивач и директор Одељења топографске анатомије на Факултету медицинских наука у Бело Хоризонтеу (Минас Жерас, Бразил), руководилац анатомије и хируршке анатомије Одељења анатомије на Нортвестерн универзитету Медицинског, Стоматолошког и Постдипломског факултета; оснивач и директор Одељења за анатомију МФО у Толеду; оснивач и декан Дипломске школе; професор емеритус у 70. години (1990). После пензионисања ради као асистент председника МФО, саветник председника и декан емеритус (1992–2004). Био је члан издавачког савета 34 научна часописа, саветник у 92 магистеријума и доктората.

Кључне речи: професор Либерато Џ. А. Дидио; анатомија; морфологија; XVIII Интернационални симпозијум морфолошких наука – Београд 2005