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FOTOGRAFSKO ODELJENJE PROFESORA ALEKSANDRA KOSTIĆA – OSNIVANJE, DOMETI I ZNAČAJ

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SAŽETAK

Godine 1924. dr Aleksandar Đ. Kostić, prvi profesor histologije i embriologije i osnivač Histološkog instituta Medicinskog fakulteta u Beogradu, u sastavu Instituta je oformio i Fotografsko odeljenje. Prve fotografije su bile mikrofotografski snimci histoloških preparata, od kojih je izvestan broj objavljen već 1925. godine u Mikrofotografskom atlasu normalne histologije. Veći broj snimaka, međutim, iskorišćen je za izradu mikrofotograma, odnosno crno-belih dijapozitiva, koji su prikazivani na predavanjima i vežbama. U narednim godinama profesor Kostić je proširio fotografske teme i na patohistološke preparate, mokraćne kristale i bakteriološke uzorke, operativni i obdukcioni materijal, embriološke i teratološke uzorke. Posebno važna aktivnost Odeljenja bilo je i snimanje pacijenata. Pacijenti su fotografisani u bolnicama ili u ateljeu Fotografskog odeljenja. Pored fotografija, tu su snimljeni i prvi filmovi pod nazivom *Krvotok u trbušnoj opni žabe* i *Krvotok u međuprstnoj opni žabe*. Tokom okupacije u Drugom svetskom ratu, Nemci su odneli fotografsku opremu i potrošni materijal, ali je nakon oslobođenja, već početkom 1946. godine, rad bio obnovljen. Pored fotografisanja, profesor Kostić je organizovao snimanje i režirao prve medicinske filmove u prvim posleratnim godinama. Odeljenje je i dalje bilo centar za medicinsku fotografiju na Fakultetu, a profesor Kostić je bio rukovodilac sve do 1952, kada je iz političkih razloga udaljen sa Medicinskog fakulteta.

Ključne reči: Fotografsko odeljenje, Aleksandar Đ. Kostić, mikrofotografski snimci, *Mikrofotografski atlas normalne histologije*, mikrofotogrami, medicinski filmovi

Uvod

Razvoj medicinske fotografije u Srbiji počinje četiri godine nakon osnivanja Medicinskog fakulteta u Beogradu i dve godine nakon početka rada Histološkog instituta (1,2). Glavnu ulogu u tom poduhvatu imao je dr Aleksandar Kostić, prvi profesor histologije i embriologije i prvi upravnik Histološkog instituta na Medicinskom fakultetu u Beogradu (2,3). Naime, on je u prostorijama Škole za nudilje Društva Crvenog krsta, gde je Histološki institut bio privremeno smešten, formirao Fotografsko odeljenje. U početku je izrađivao mikrofotografske snimke histoloških preparata, dok je kasnije proširio spektar tema i interesovanja i na patohistološke preparate, mokraćne kristale i bakteriološke uzorke, operativni i obdukcioni materijal, embriološke i teratološke uzorke i pacijente, a zatim i na snimanje medicinskih dokumentarnih filmova. Prema Kostićevim rečima, Odeljenje je na Međunarodnoj izložbi medicinske fotografije, održanoj 1950. godine u Londonu, od strane „merodavnih" označeno „pionirem medicinske fotografije u svetu", uz objašnjenje da su „slični zavodi osnivani u Engleskoj tek pred rat, a mnogi tek posle poslednjeg rata". Kao primer je navedeno Fotografsko odeljenje Medicinskog fakulteta pri Vestminsterskoj bolnici koje je osnovano „tek 1946. godine" (4).

HISTORY OF MEDICINE

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PHOTOGRAPHY DEPARTMENT OF PROFESSOR ALEKSANDAR KOSTIĆ – ESTABLISHMENT, ACHIEVEMENTS AND SIGNIFICANCE

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SUMMARY

In 1924, Dr. Aleksandar Đ. Kostić, the first Professor of Histology and Embryology and the founder of the Institute of Histology at the Faculty of Medicine in Belgrade, formed the Photography Department within the Institute. The first photographs were microphotographs of histological specimens and a certain number of them were published in 1925 in the *Microphotographic Atlas of Normal Histology*. However, a greater number of photographs were used for the preparation of microphotograms, that is, black and white diapositives which were shown during lectures and laboratory practices. In the following years, Professor Kostić expanded his photographic topics to pathohistological specimens, urine crystals, and bacteriological samples, operative and autopsy material, and embryological and teratological samples. A particularly important activity of the Department was making photographs of patients. Patients were photographed in hospitals or in the studio of the Photography Department. In addition to photographs, the first films entitled *Blood flow in the peritoneal membrane of a frog* and *Blood flow in the interdigital membrane of a frog* were made there. During the Second World War occupation, the Germans took away the photographic equipment and consumables, but after the liberation, at the beginning of 1946, the work was restored. In addition to photography, Professor Kostić organized filming and he directed the first medical films in the first post-war years. The Department was still the center of medical photography at the Faculty, while Professor Kostić was the head until 1952, when he was removed from the Faculty of Medicine due to political reasons.

Keywords: Photography Department, Aleksandar Đ. Kostić, microphotographs, *Microphotographic Atlas of Normal Histology*, microphotograms, medical films

Introduction

The development of medical photography in Serbia began four years after the establishment of the Faculty of Medicine in Belgrade and two years after the establishment of the Institute of Histology (1,2). Dr. Aleksandar Kostić, the first Professor of Histology and Embryology and the first director of the Institute of Histology at the Faculty of Medicine in Belgrade, played a major role in that endeavor (2,3). Namely, he formed the Photography Department in the premises of the Red Cross Society Nursing School, where the Institute of Histology was temporarily located. In the beginning, he made microphotographs of histological specimens, while he later expanded the range of topics and interests to pathohistological specimens, urine crystals, bacteriological samples, operative and autopsy material, embryological and teratological samples and patients, and then to making medical documentaries. According to Kostić, at the International exhibition of medical photography held in London in 1950, the Department was marked as "the pioneer of medical photography in the world" by the "authorities", with the explanation that "similar institutes were founded in England only before the war, and many were founded only after the last

Aleksandar Đ. Kostić, osnivač Fotografskog odeljenja

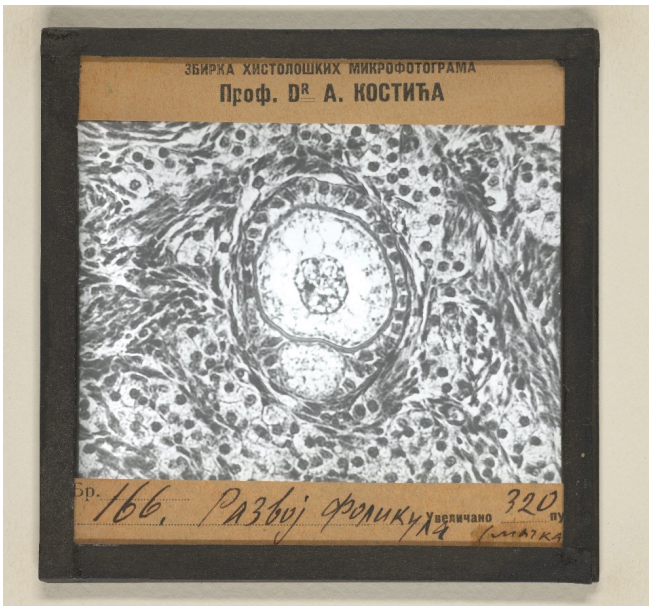
Aleksandar Đ. Kostić (1893 – 1983) je još kao gimnazijalac snimio svoje prve fotografije (5). Po završetku osnovne škole i Druge muške gimnazije u Beogradu (danas Filološka gimnazija), upisao je Medicinski fakultet u Nansiju u Francuskoj. Kao student medicine i dobrovoljni hospitant na Histološkom institutu u Nansiju, 1913. godine je snimio prve mikrofotografije, ali su one nestale tokom Prvog svetskog rata (5). Inače, dva puta je prekidao studije medicine, kako bi se vraćao u zemlju i kao dobrovoljac učestvovao u Balkanskim i Prvom svetskom ratu. Završio je Medicinski fakultet u Strazburu odbranivši doktorsku tezu u julu 1921. godine. Iste godine, 21. novembra, postavljen je za profesora normalne histologije na novoosnovanom Medicinskom fakultetu u Beogradu. Po povratku u Beograd, u januaru 1922. otpočeo je pripreme na organizaciji nastave da bi već u martu održao svoje prvo predavanje studentima. Do useljenja u sopstvenu, namenski sazidanu zgradu 1927. godine, Histološki institut se nekoliko puta selio. Najpre je radio u dvema sobama upravne zgrade Glavne vojne bolnice, potom neko vreme u Fizičkom institutu Filozofskog fakulteta, pa u prostorijama Škole za nudilje Društva Crvenog krsta. Upravo u toj školi, 1924. godine Kostić je osnovao Fotografsko odeljenje (6) i svoja znanja stečena u Nansiju na polju mikrofotografije primenio u uspostavljanju rada u Beogradu (slika 1).

Prve tekovine Fotografskog odeljenja

Prvi snimci napravljeni u Fotografskom odeljenju bili su mikrofotografski snimci histoloških preparata, urađeni mikrofotografskim aparatom *Uma* firme Lajc (*Leitz*) (1,6,7). Rezultati tog rada su bili vidljivi stručnoj javnosti već 1925. godine, kada je izašao iz štampe *Mikrofotografski atlas normalne histologije*. Kako je navedeno u predgovoru, Atlas sadrži 150 originalnih mikrofotografija jer je cilj autora bio da što vernije predstavi mikroskopski sastav i sklop organa i tkiva iz kojih je jedan organizam sagrađen i da na taj način doprinese razumevanju teorijskih pojmova. Kostić u predgovoru ukazuje i na manjkavost crteža kao jedinog sredstva koje se do tada koristilo u nastavi i na problematiku verodostojnosti crteža kod određenih preseka tkiva. Odlučio se za korak dalje u korist nauke i crtež zamenio nečim što verno reprodukuje original, a to je – mikrofotografija (7).

Da Atlas ne bi premašio obim koji je prvobitno zamišljen, određeni snimci organa i tkiva „manje važnosti" su bili izostavljeni, ali je Znanstveni zavod

Slika 1. Profesor Kostić i dr Aleksandar Telebaković sa mikrofotografskim aparatom *Uma* u Fotografskom odeljenju 1927. godine. Iza prefesora Kostića se vidi deo mikrokinematografskog aparata *Ascania*, a na zidu u centru fotografije nekoliko postera urađenih u samom Odeljenju. Institut za histologiju i embriologiju „Prof. dr Aleksandar Đ. Kostić" Medicinskog fakulteta Univerziteta u Beogradu.



Slika 2. Crno-beli dijapozitiv (mikrofotogram) „Razvoj folikula". Institut za histologiju i embriologiju „Prof. dr Aleksandar Đ. Kostić" Medicinskog fakulteta Univerziteta u Beogradu, Zbirka histoloških mikrofotograma prof. dr A. Kostića.

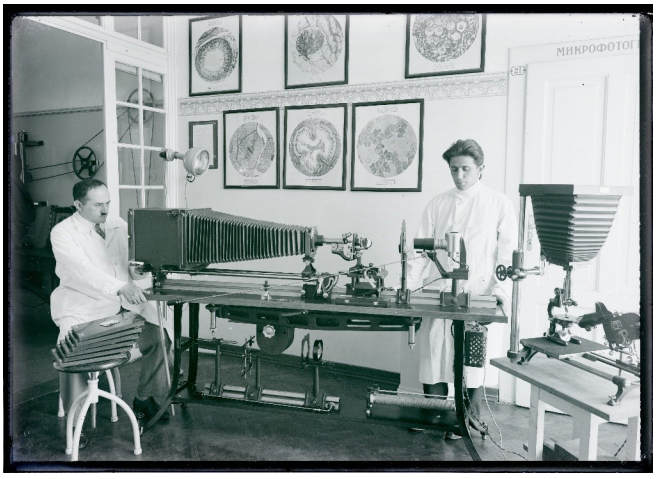
war". The Photography Department of the Faculty of Medicine at the Westminster Hospital, which had been founded "only in 1946", was mentioned as an example (4).

Aleksandar Đ. Kostić, the founder of the Photography Department

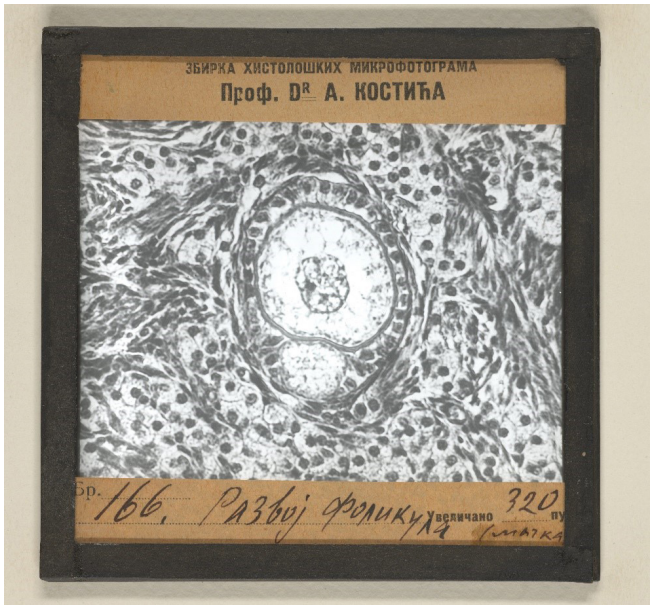
Aleksandar Đ. Kostić (1893-1983) took his first photographs as a high school student (5). After he finished primary school and the Second Male High School in Belgrade (today the Philological High School), he enrolled at the Faculty of Medicine in Nancy, France. As a medical student and volunteer at the Institute of Histology in Nancy, he took the first microphotographs in 1913, but they disappeared during the First World War (5). Otherwise, he interrupted his medical studies twice, in order to return to the country and take part in the Balkans and the First World War as a volunteer. He graduated from the Faculty of Medicine in Strasbourg and defended his doctoral thesis in July, 1921. In the same year, on November 21st, he was appointed professor of Normal Histology at the newly founded Faculty of Medicine in Belgrade. After he returned to Belgrade, in January 1922, he began preparations for the organization of classes in order to give his first lecture to students in March. Until moving into its own purpose-built building in 1927, the Institute of Histology had moved several times. First, it worked in two rooms of the administration building of the Main Military Hospital, then for some time in the Institute of Physics of the Faculty of Philosophy, and then in the premises of the Red Cross Society Nursing School. It was precisely in that school that Kostić founded the Department of Photography in 1924 (6) and applied the knowledge acquired in Nancy in the field of microphotography to establish the work in Belgrade (Picture 1).

The first acquirements of the Photography Department

The first photographs made in the Photography Department were microphotographs of histological specimens, made with the Leitz microphotographic camera *Uma* (1,6,7). The results of that work were visible to the professional public as early as 1925, when the *Microphotographic Atlas of Normal Histology* was published. As it was stated in the preface, the Atlas contains 150 original microphotographs, because the author's aim was to present as faithfully as possible the microscopic composition of organs and tissues, which one organism is made from,



Picture 1. Professor Kostić and Dr. Aleksandar Telebaković with the Uma microphotographic camera in the Photography Department in 1927. A part of the Askania microcinematography camera can be seen behind Professor Kostić, as well as the photos of several posters in the center of the wall. The Institute of Histology and Embryology "Prof. dr Aleksandar Đ. Kostić" of the Faculty of Medicine, University of Belgrade.



Picture 2. Black and white diapositive (micro-photogram) "Follicle development". The Institute of Histology and Embryology "Prof. dr Aleksandar Đ. Kostić" of the Faculty of Medicine, University of Belgrade. Collection of histological microphotograms of Prof. A. Kostić.

prof. Breslera (*Brössler*) preuzeo na sebe obavezu da na osnovu njih izradi mikrofotograme, tj. crnobele dijapozitive, koji su se i prodavali naučnim i nastavnim ustanovama (7). Dijapozitivi su bili intenzivno korišćeni u nastavi, projektovani su tokom predavanja i nakon uvodnih časova na vežbama. Predstavljali su drugu veliku tekovinu Fotografskog odeljenja (slika 2).

Kao eventualni uzor u pristupu i ideji koja je vodila Kostića ka Mikrofotografskom atlasu normalne histologije, može se izdvojiti prvi udžbenik iz histologije na švedskom jeziku iz 1920. godine, autora Emila Holmgrena (*Emil Holmgren*), profesora histologije sa Karolinska instituta u Stokholmu (8). Važno je istaći da se prof. Holmgren tada, kao i Kostić nekoliko godina kasnije, nije zadovoljavao čisto morfološkim opisom, već je gradivo analizirao sa razvojnog i sa funkcionalnog, tj. fiziološkog aspekta. Na osnovu trenutno dostupne literature, može se zaključiti da je to bio prvi udžbenik iz histologije koji je u potpunosti bio ilustrovan mikrofotografijama – čak 782. Pojedina tkiva, poput nervnog, bila su znatno verodostojnija na fotografijama, nego na bilo kom crtežu koji je izrađen tih godina. Ova činjenica nas navodi na zaključak da su težnje prof. Holmgrena da se napusti forma crteža i uvede mikrofotografija u službu nauke uspele. Taj put u razmišljanjima i radu je sledio i prof. Kostić.

Treća velika tekovina Fotografskog odeljenja, kojom se profesor Kostić ponosio bila je serija uveličanih mikrofotografskih snimaka, štampanih u formatu postera (slika 3). Za uveličavanje snimaka Odeljenje je imalo posebnu prostoriju, a radilo se na aparatu *Furor II* (1,6).

Važno je naglasiti da su u Odeljenju snimane prve mikrofotografije u Kraljevini Srba, Hrvata i Slovenaca, te se ono s pravom označava prvim jugoslovenskim centrom za naučnu fotografiju (1).

Početkom marta 1925. godine, u Fotografsko odeljenje Histološkog instituta dolazi Aleksandar Šafranski, ruski vojni fotograf. Šafranski je dao izuzetan doprinos u oblasti teorijskih razmatranja fotografije tokom treće i četvrte decenije 20. veka. On je zajedno sa profesorom Kostićem razvijao Fotografsko odeljenje. Bio je i aktivan član Beogradskog foto-kluba, koji je 1928. godine osnovao prof. Kostić sa ciljem razvijanja umetničke i naučne fotografije, popularisanja fotografije u turističke svrhe i edukacije (9).

Slika 3. Mikrofotgrafki snimak u formatu postera „Langerhansovo ostrvo". Institut za histologiju i embriologiju „Prof. dr Aleksandar Đ. Kostić" Medicinskog fakulteta Univerziteta u Beogradu, Zbirka histoloških postera prof. dr A. Kostića.

Fotografsko odeljenje u novoj zgradi Histološkog instituta

Kada je 1927. godine Histološki institut preseljen u svoju novu zgradu, Fotografsko odeljenje je dobilo značajan prostor od skoro 160m^2 i dodatnu opremu. Nalazilo se na prvom spratu centralnog dela zgrade Fiziološkog i Histološkog instituta, pored amfiteatra, i raspolagalo je nizom prostorija (1,6).

U velikom hodniku, duž jedne strane bili su smešteni: ormani za sušenje negativa toplim vazduhom, za čuvanje negativa, za fotografsku biblioteku i čuvanje fotografskog materijala, za aparate i optiku, kao i veliki sto za hemikalije. Na drugoj strani hodnika bio je montiran mikrokinematografski aparat *Ascania* sa „ubrzavajućim aparatom", koji je omogućavao 200 snimaka u sekundi (6,10). Upravo na ovom uređaju profesor Kostić je snimio seriju sekvenci za prve filmove *Krvotok u trbušnoj opni žabe* i *Krvotok u međuprstnoj opni žabe*. Međutim, o njima se danas, osim naziva, ne zna gotovo ništa jer su uništeni tokom Drugog svetskog rata (11).

and thus, contribute to understanding theoretical concepts. In the preface, Kostić points out the shortcomings of drawings as the only means used for teaching until that time and the problem of the credibility of drawings in the case of some tissue sections. He decided to go a step further in favor of science and he replaced drawings with something that faithfully reproduces the original, which is a microphotograph (7).

Certain images of organs and tissues that were "less important" were omitted so that the Atlas would not exceed the scope that was originally conceived, but the Scientific Institute of Professor Brössler took upon himself the obligation to create microphotograms, that is, black and white diapositives, which were sold to scientific and educational institutions (7). Diapositives were intensively used in classes, they were projected during lectures and after the introductory lessons during exercises. This represented the second major asset of the Photography Department (Picture 2).

The first histology textbook in the Swedish language from 1920, written by Emil Holmgren, Professor of Histology at the Karolinska Institute in Stockholm can be singled out as a possible model for the approach and idea that led Kostić towards the *Microphotographic Atlas of Normal Histology* (8). It is important to point out that professor Holmgren then, like Kostić a few years later, was not satisfied with a purely morphological description, but analyzed the material from a developmental and functional point of view, i.e. physiological aspect. Based on the currently available literature, it can be concluded that it was the first textbook in histology that was completely illustrated with microphotographs – even 782. Certain tissues, such as the nervous, were much more faithful in photographs than in drawings that were made at that time. This fact leads us to the conclusion that the aspirations of professor Holmgren to abandon the form of a drawing and introduce microphotography in the service of science succeeded. This way of thinking and work was also followed by professor Kostić.

The third major achievement of the Photography Department, which professor Kostić was proud of, was a series of enlarged micro-photographs, printed in poster format (Picture 3). The Department had a special room for magnifying the images and a *Furor II* camera was used (1,6).

Picture 3. Microphotograph in the poster format "Island of Langerhans". Institute of Histology and Embryology "Prof. dr Aleksandar Đ. Kostić" of the Faculty of Medicine, University of Belgrade, Collection of histological posters of Professor A. Kostić.

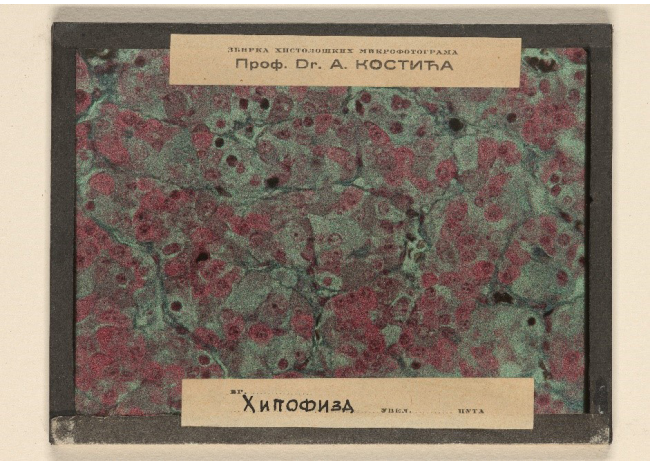
It is important to emphasize that the first microphotographs in the Kingdom of Serbs, Croats and Slovenes were taken in the Department, and it is rightly called the first Yugoslav center for scientific photography (1).

At the beginning of March 1925, Aleksandar Shafransky, the Russian military photographer, came to the Photography Department of the Institute of Histology. Shafransky made a significant contribution to the field of theoretical considerations of photography during the third and fourth decades of the 20th century. Together with Professor Kostić, he developed the Department of Photography. He was also an active member of the Belgrade Photo Club, which was founded in 1928 by professor Kostić with the aim of developing artistic and scientific photography, popularizing photography for tourist purposes and education (9).

Hodnikom se dalje dolazilo do ateljea u kome su snimani pacijenti, preparati i drugi predmeti. Atelje je bio prilagođen snimanju kako pri dnevnoj, tako i pri veštačkoj svetlosti. Dovoljan priliv dnevne svetlosti omogućavao je veliki prozor sa mutnim staklom i plavim pokretnim zavesama, dok su veštačku svetlost obezbeđivali jaki reflektori. Dobro osvetljenje je bilo posebno potrebno prilikom snimanja pojedinih patoloških promena kod pacijenata, posebno onih na koži (6,10).

Iz ateljea se nadesno ulazilo u sobu za hromofotografiju u kojoj su izrađivani snimci u boji, pozitivi i dijapozitivi. Pozitivi u boji rađeni su po sistemu *Jos-pe*, a snimano je sa specijalnim aparatom, sa dimenzijom snimaka 9 x 12 cm. Dijapozitivi u boji radili su se po sistemu autohromnog procesa po Limijeru. Na Institutu je sačuvano 43 dijapozitiva u boji i oni danas predstavljaju izuzetno retke primerke svoje vrste ne samo kod nas, već i u svetu (slika 4). Razlog za tako mali broj sačuvanih autohroma leži u činjenici da su bili izuzetno osetljivi na svetlost i vlagu. Levo od ateljea bila je prostorija za mikrofotografiju opremljena velikim mikrofotografskim aparatom *Uma* firme *Leitz*. Iz nje se ulazilo u dve mračne komore izuzetno moderno opremljene, koje su u zidovima imale uzidana korita od armiranog betona obložena keramičkim pločicama (6,10).

Pored mračnih komora bila je soba za uveličavanje opremljena aparatom *Furor* II. Tu je bio instaliran i aparat za kopiranje kinematografskih filmova, kao i uređaj za „izazivanje" i sušenje filmova.



Slika 4. Dijapozitiv u boji (autohrom) „Hipofiza". Institut za histologiju i embriologiju „Prof. dr Aleksandar Đ. Kostić" Medicinskog fakulteta Univerziteta u Beogradu, Zbirka histoloških mikrofotograma prof. dr A. Kostića.

Iz sobe za uveličavanje ulazilo se u sobu za ispiranje. Na jednom zidu ove prostorije bila su ugrađena korita za ispiranje negativa i pozitiva, a iznad korita bile su žice sa štipaljkama za sušenje pozitiva (1,6).

Opremu za Fotografsko odeljenje profesor Kostić je nabavio od Znanstvenog zavoda prof. Breslera (*Brössler*), koji je osnovan 1923. godine u Zagrebu, sa podružnicama u Beogradu i Ljubljani. Saradnja Kostića sa pomenutim zavodom navodi se i u tekstu objavljenom u Vesniku kulture iz 1927. godine pod nazivom *Znanstveni zavod profesora dr Breslera Zagreb – Beograd*. U tekstu se navodi: „Isto tako institut g. Dr. Kostića za znanstvenu fotografiju izrađen je od strane ovog preduzeća savršeno" (12).

U ovako moderno opremljenom Fotografskom odeljenju stekli su se uslovi da Kostić napravi veliki iskorak u pogledu drugih tema snimanja. Počeo je sa izradom mikrobioloških i patohistoloških, kao i mikrofotografskih snimaka mokraćnih kristala, zatim embrioloških i teratoloških snimaka. Fotografsko odeljenje je bilo i prva ustanova u Srbiji za medicinska snimanja, a imala je i urednu fotografsku dokumentaciju, takozvanu fototeku (3). Pojedini snimci pacijenata su dragoceni za istoričare medicine jer su na njima zabeležene patološke promene koje se zahvaljujući napretku dijagnostičkih i terapijaskih protokola u medicini, kao i otkriću i uvođenju vakcina, danas više ne viđaju u medicinskoj praksi.

Ideja profesora Kostića o izuzetno savremenom opremanju prostora Fotografskog odeljenja bila je posledica njegove spoznaje o značaju takve službe, ne samo za potrebe Histološkog instituta i Medicinskog fakulteta, već i drugih ustanova van Fakulteta. Kostić je već do 1935. godine uspostavio saradnju sa kolegama iz čak 47 obrazovnih i drugih institucija. Iz te saradnje je proistekao veliki broj snimaka sa motivima biljaka, različitih životinja, paleontoloških preparata, fosilnih ostataka, arheoloških artefakata, različitih instrumenata i drugih tema (1,6).

Razmera i bogatstva snimljenih motiva postali smo svesni tek nedavnim otkrićem fotografske zaostavštine profesora Kostića, za koju se decenijama nije znalo da postoji. Zaostavštinu čini nekoliko hiljada fotografskih staklenih ploča, zatim teratološka kolekcija, kao i (pred)ratna arhiva i brojni naučni separati i dokumenta (13).

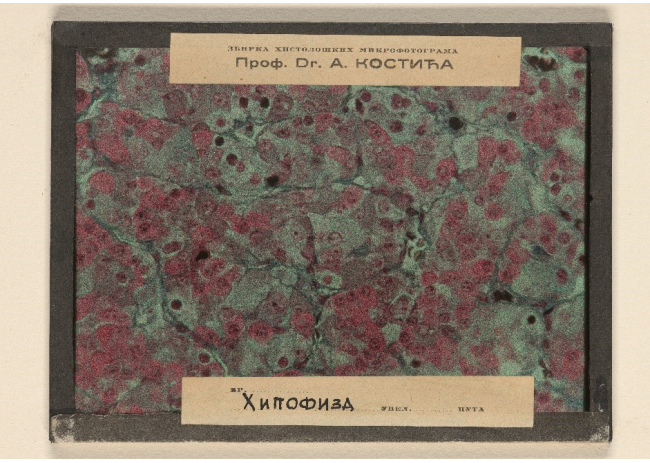
Pored izrade fotografija, Odeljenje je omogućilo i mnogim nastavnicima Univerziteta u Beogradu

The Photography Department in the new building of the Institute of Histology

When the Institute of Histology was moved to its new building in 1927, the Photography Department received a significant space of almost 160 m^2 and additional equipment. It was located on the first floor of the central part of the building of the Institute of Histology and Physiology, next to the amphitheatre and it had a series of rooms (1,6).

In the large corridor, along one side, there were: cabinets for drying negatives with warm air, for storing negatives, for the photographic library and storing photographic material, for apparatuses and optics, as well as a large desk for chemicals. On the other side of the corridor, *Ascania* microcinematographic camera with an "accelerating mechanism" was mounted, and it enabled 200 shots per second (6,10). It was precisely on this device that Professor Kostić recorded a series of sequences for the first films *the Blood flow in the peritoneal membrane of a frog* and t*he Blood flow in the interdigital membrane of a frog*. However, apart from the name, almost nothing is known about them today because they were destroyed during the Second World War (11).

The corridor led to the studio where patients, preparations and other objects were filmed. The studio was adapted to shooting in both daylight and artificial light. Sufficient daylight was provided by a large window with opaque glass and blue movable curtains, while the artificial light was provided by strong reflectors. Good light was particularly necessary when recording certain pathological changes in patients, especially those on the skin (6,10).



Picture 4. Colored diapositive (autochrome) "Pituitary gland". Institute of Histology and Embryology "Prof. dr Aleksandar Đ. Kostić" of the Faculty of Medicine, University of Belgrade, Collection of histological microphotograms of Professor A. Kostić.

From the studio, on the right side was the chromophotography room, where colored images, positives and diapositives were made. Positives were made based on the system *Jos-pe*, and a special camera was used while the dimension of the images was 9 x 12 cm. Colored diapositives were made based on the system of autochrome process patented by Lumier. Forty-three colored diapositives were preserved at the Institute and today they represent extremely rare examples of their kind not only in our country, but in the world, as well (Picture 4). The reason for such a small number of preserved autochromes lies in the fact that they were extremely sensitive to light and moisture. On the left of the studio was a room for microphotography equipped with a large *Uma* microphotographic camera made by the Leitz company. This room led to two dark chambers that were modernly equipped, and had built-in troughs made of reinforced concrete coated with ceramic tiles (6,10).

In addition to dark chambers, there was a room for magnifying that was equipped with camera *Furor II*. There was also a device for copying cinematographic movies, as well as a device for "provoking" and drying movie tape. The room for magnifying led to the room for rinsing. Built-in troughs for rinsing negatives and positives were on one wall of this room, while wires with clippers for drying positives were above the troughs (1,6).

Professor Kostić got the equipment for the Photography department from the Scientific Institute of professor Brössler, which was founded in Zagreb in 1923, with branches in Belgrade and Ljubljana. The collaboration between Kostić and the aforementioned Institute is described in the text that was published in the magazine „Vesnik kulture" in 1927 under the name "The Scientific Institute of Professor Brössler Zagreb-Beograd". It is also stated in the text: "the Institute of Professor Kostić for scientific photography was made by this company perfectly" (12).

In such a modern photographic department, the conditions enabled Kostić to make a large step forward in terms of other filming themes. He started

savladavanje fotografske tehnike i tehnike izrade fotografija i slajdova. Takođe, bilo je i uzor u organizovanju prostora i nabavci opreme mnogim kasnije uspostavljenim fotografskim laboratorijama na Univerzitetu (1).

Fotografsko odeljenje prof. Kostića u posleratnom periodu

Tokom aprilskog bombardovanja Beograda 1941. godine, pogođena je zgrada Fiziološkog i Histološkog instituta, i tom prilikom je delimično oštećen inventar Fotografskog odeljenja. Aparate i opremu koji su „preživeli" bombardovanje, odneo je nemački okupator, pa je Odeljenje bilo potpuno opustošeno (2). Međutim, ubrzo po oslobođenju, počinje obnova Fotografskog odeljenja i nabavka odgovarajuće opreme za izradu fotografija, ali i moderne kamere i kompletna oprema za izradu filmova.

U radu u Fotografskom odeljenju prof. Kostiću su od kraja 1945. pomagala i dva saradnika: fotograf Vladimir Jelovac i kinooperater Milisav Jakovljević, koji su u prvim mesecima rada, dok nije stigla sva naručena oprema, svoju fotografsku opremu stavljali besplatno na raspolaganje Odeljenju (14). Vladimir Jelovac je bio magistar farmacije i odličan poznavalac fotohemije, ali i konstruktor dodataka za Lajkine kamere. Sa druge strane, Milisav Jakovljević je bio dugogodišnji kino-operater sa velikim iskustvom u inostranstvu (slika 5) (15).

Profesor Kostić je prvim posleratnim godinama režirao i nekoliko medicinskih filmova, međutim, njihov tačan broj u ovom momentu nije poznat. Naime, sam Kostić u jednom rukopisu pominje da ih je bilo dvanaest, ali navodi naslove njih šest (5, 11). U svakom slučaju, bili su to prvi medicinski filmovi u Jugoslaviji, neki od njih snimljeni čak i pre igranih filmova (5,11). Na normalnoj traci (35 mm) je 1945. (ili 1946.) snimljen film *Izrada histoloških preparata* (u dva dela), a snimatelj je bio Milisav Jakovljević. Na uzanoj (16 mm) traci između 1946. i 1949. snimljeno je preostalih 5 filmova, čiji naslovi su nam poznati: *Tumor kičmene moždine* (operator prof. Slobodan Kostić), *Perikardioliza* (operator prof. Vojislav Stojanović), *Resekcija želuca* (operator prof. Milivoje Kostić), *Litlova bolest/Fersterova operacija* (operator prof. Dimitrije Jovčić) i *Judinova operacija jednjaka/Plastika jednjaka* (operator prof. Isidor Papo, u to vreme sanitetski pukovnik, kasnije general) (5,11). Za snimanje je korišćena *Roloflex* kamera, a snimatelj je bio Kosta Novaković, pionir jugoslovenske kinematografije, inače magistar farmacije (5,11). Svi filmovi su bili dužine između 250 i 260 metara. Kostićeva uloga u režiji se, prema njegovim sopstvenim rečima, više svodila na dirigovanje i organizovanje uveličanja, dok su

Slika 5. Profesor Kostić sa saradnicima Foto-filmskog zavoda, oko 1950. godina. Institut za histologiju i embriologiju „Prof. dr Aleksandar Đ. Kostić" Medicinskog fakulteta Univerziteta u Beogradu.

making microbiological and pathohistological, as well as microphotographic images of urine crystals, then embryological and teratological records. The Photography Department was the first institution in Serbia for medical recordings, and had neat photographic documentation, the so-called photo archive (3). Some images of patients are valuable for medical historians because they present some pathological changes that are not seen today in medical practice thanks to the advance of diagnostic and therapeutic protocols in medicine, as well as the discovery and introduction of vaccines.

The idea of Professor Kostić about equipping the Photography Department with modern equipment was the result of his realization of the significance of such a service, not only for the needs of the Institute of Histology and the Faculty of Medicine, but also for other institutions outside the faculty. Until 1935, Kostić had established collaboration with colleagues from even 47 educational and other institutions. A large number of recordings with the motifs of plants, different animals, paleontological preparations, fossil remains, archeological artifacts, different instruments and other topics resulted from that collaboration (1,6).

We only became aware of the scale and richness of the captured motifs with the recent discovery of Professor Kostić's photographic heritage, which was not known for decades. The legacy consists of several thousand photographic glass plates, then a teratological collection, as well as a (pre)war archive and numerous scientific papers and documents (13).

In addition to making photographs, the Department also enabled many teachers of the University of Belgrade to master photographic techniques of making photographs and slides. Also, it was a role model regarding the organization of space and the procurement of equipment for many later-established photographic laboratories at the University (1).

Professor Kostić's Photography Department in the post-war period

During the bombing of Belgrade in April, 1941, the building of the Institute of Histology and Physiology was hit, and on that occasion, the inventory of the Photography Department was partially damaged. The devices and equipment that "survived" the bombing were taken away by the German soldiers, so the Department was completely devastated (2). However, shortly after

Picture 5. Professor Kostić with associates of the Photo-film Institute around 1950. The Institute of Histology and Embryology "Prof. dr Aleksandar Kostić" of the Faculty of Medicine, University of Belgrade.

„neprikosnoveni reditelji" bili profesori koji su izvodili operacije. Inače, svi pomenuti profesori su bili velikani srpske i jugoslovenske hirurgije.

Pored pomenutih filmova, snimljena je i serija od pet ili šest kratkih informativnih filmova, takozvanih *Medicinskih žurnala*, dužine oko 120 metara. U njima su prikazani karakteristični slučajevi sa klinika Medicinskog fakulteta. Snimatelj žurnala bio je takođe Kosta Novaković (11). Nije poznato da li su sačuvni do danas.

Ideja je bila i da se nastavi sa snimanjem takvih kratkih edukativnih filmova namenjenih studentima i lekarima, i da se snimanje interesantnih slučajeva radi u svim većim bolnicama, ali i domovima zdravlja u Srbiji. Bili su urađeni i scenariji za izradu filmova o pravilnom pregledu bolesnika, davanju injekcija, izvođenju punkcija, transfuzija i drugog, ali do realizacije nije došlo (11).

Prema Kostićevim rečima, zastoj u izradi medicinskih filmova je nastao kada je Fotografsko odeljenje izdvojeno iz sastava Histološkog instituta i pretvoreno u samostalnu ustanovu pod nazivom Foto-filmski zavod, pod neposrednom upravom Medicinskog fakulteta (16).

Međunarodna izložba medicinske fotografije u Londonu

Profesor Kostić je 1950. godine učestvovao na Međunarodnoj izložbi medicinske fotografije u Londonu. Pored fotografija, te godine je na izložbi bio prijavljen tek jedan film biološkog odeljenja fabrike Ciba iz Bazela pod nazivom *Xenopus laevis*. Iako Kostić nije bio prijavio ni jedan svoj medicinski film, bilo mu je omogućeno da pred Savetom Kraljevskog društva (*Royal Society*) i njegovim predsednikom, nobelovcem ser Henri Delom (*Sir Henry Dale*) prikaže jedan od *Medicinskih žurnala*. Film je naišao na veliko interesovanje i vrlo pozitivne komentare. Stoga je usledio dogovor da se između Društva i Foto-filmskog zavoda uspostavi saradnja i razmena filmova. Za svaki film ustupljen Društvu Zavod je trebalo da dobije medicinski film u boji. Međutim, nije došlo do realizacije te saradnje. Moguće da je uklanjanje profesora Kostića sa Medicinskog fakulteta bilo uzrok tome (11,17). Na pozitivne komentare u Londonu su naišli i filmovi *Operacija tumora kičmene moždine* i *Perikardiektomija*, koji su prikazani pred gospodinom Vilsonom (*Wilson*), direktorom Fotografskog instituta.

Foto-filmski zavod

U proleće 1950. godine Fotografsko odeljenje je izdvojeno u zasebnu ustanovu pod nazivom Foto-filmski zavod Medicinske velike škole u Beogradu. U to vreme, tačnije od 21.6.1948. do 28.7. 1954. godine, tri fakulteta – Medicinski, Farmaceutski i Stomatološki, bila su izdvojena iz sastava Univerziteta u Beogradu i organizovana u okviru Medicinske velike škole, ustanove u rangu univerziteta (18). Cilj Zavoda bio je da organizuje i obavlja celokupnu foto-filmsku aktivnost Medicinske velike škole u oblasti nastave i naučno-istraživačkog rada, da prati razvoj opšte i naučne fotografije i kinematografije i obučava mlade kadrove za Foto-filmsklu službu u medicini (3). Za upravnika Foto-filmskog zavoda je određen prof. Kostić. Međutim, on je u martu 1952. godine udaljen sa Medicinskog fakulteta iz političkih razloga, a za upravnika je imenovan prof. Mileta Magarašević. Foto-filmski zavod je nakon prof. Magaraševića vodio dr Miodrag Mile Đorđević, zatim Dragan Pantelić, a 1998. godine je na inicijativu prof. Vesne Lačković, tadašnje upravnice Histološkog instituta, vraćen u sastav Instituta. Međutim, u januaru 2006. godine Zavod je prestao sa radom (2). Bio je to danak razvoju savremene fotografske tehnologije, dostupnosti fotografije i video zapisa putem mobilnih telefona, dostupnosti različitih fotografskih i filmskih sadržaja i brze razmene podataka putem interneta.

Fotografsko odeljenje koje je osnovao prof. dr Aleksandar Kostić imalo je istorijsku ulogu u naučno-obrazovnom sistemu Medicinskog fakulteta i njegovih instituta, naročito za samu histologiju. Kostićev doprinos razvoju medicinske dokumentarne fotografije je nemerljiv i zavređuje posebnu pažnju, jer je on na Fotografskom odeljenju Instituta za histologiju, kako sam navodi „izradio prve fotomikrograme u Jugoslaviji, a među prvima i u Evropi" (19).

Fotografsko odeljenje bilo je i pionir medicinskog filma na ovim prostorima. Duboko svestan značaja naučnih filmova za potrebe edukacije studenata medicine, ali i lekara, profesor Kostić je i po uklanjanju sa fakulteta nastavio da se bori i zalaže za njihovo snimanje i uvođenje u praksu kroz brojne tekstove koje je objavljivao u inostranim i domaćim naučnim i stručnim časopisima, kao i u štampi gotovo do kraja života (11,16,17,20).

the liberation, the restoration of the Photography Department began and the acquisition of appropriate equipment for making photographs, as well as modern cameras and complete equipment for making films.

In his work in the Photography Department, from the end of 1945, Professor Kostić was assisted by two assistants: photographer Vladimir Jelovac and cinematographer Milisav Jakovljević, who in the first months of work, made their photographic equipment available to the Department until all the ordered equipment arrived (14). Vladimir Jelovac was a master of Pharmacy and an expert in photochemistry, as well as a designer of accessories for Leica cameras. Milisav Jakovljević, on the other hand, was a long-time cinema operator with great international experience (Picture 5) (15).

Professor Kostić also directed several medical films in the first post-war years, however, their exact number is not known at the moment. Namely, Kostić himself mentions in one manuscript that there were twelve of them, but he lists the titles of six of them (5,11). In any case, they were the first medical films in Yugoslavia, and some of them were filmed before feature films (5,11). In 1945 (or 1946), the film *Making histological specimens* (in two parts) was shot on normal film tape (35 mm), and the cinematographer was Milisav Jakovljević. Between 1946 and 1949, the remaining 5 films were shot on narrow (16 mm) tape, and their titles are known: *Tumor of the spinal cord* (operator Prof. Slobodan Kostić), *Pericardiolysis* (operator Prof. Vojislav Stojanović), *Gastric Resection* (operator Prof. Milivoje Kostić), *Little's disease/ Ferster's operation* (operator Prof. Dimitrije Jovčić) and *Yudin's surgery of esophagus/esophagoplasty* (operator prof. Isidor Papo, at that time, medical colonel, later general) (5,11). *Roloflex* camera was used for filming, while the cameraman was Kosta Novaković, a pioneer in Yugoslav cinematography, who also had a master's degree in pharmacy (5,11). All films were between 250 and 260 meters long. According to Kostić, his role in directing was more related to managing and organizing the magnifications, while "the true directors" were the professors who performed the operations. Otherwise, all of the mentioned professors were great men of Serbian and Yugoslav surgery.

In addition to the mentioned films, a series of five or six short informational films, so-called *Medical journals*, was shot and they were 120 meters long. Characteristic cases from the clinics of the Faculty of Medicine were presented in them. The cameraman of the journal was Kosta Novaković (11). It is not known whether they have been preserved to this day.

The idea was to continue filming such short educational films intended for students and doctors, and to film interesting cases in all major hospitals and health centers in Serbia. Scenarios were also prepared for the production of films about the proper examination of patients, giving injections, performing punctures, transfusions and others, but they were not realized (11).

According to Kostić, the production of medical films was interrupted when the Photography Department was separated from the Institute of Histology and turned into an independent institution under the name Photo-Film Institute, under the direct management of the Faculty of Medicine (16).

International Exhibition of Medical Photography in London

In 1950, Professor Kostić participated in the International Exhibition of Medical Photography in London. In addition to the photographs, only one film from the biological department of the Ciba factory in Basel was submitted for the exhibition that year, under the name *Xenopus laevis*. Although Kostić had not registered any of his medical films, he was given an opportunity to present one of his *Medical Journals* before the Council of the Royal Society and its president, Nobel laureate Sir Henry Dale. The film caused great interest and positive comments. Therefore, the agreement was made to establish the cooperation and exchange of films between the Royal Society and the Photo-Film Institute. The Institute was supposed to receive colored medical film for each film given to the Society. However, that cooperation was not realized. It is possible that the removal of Professor Kostić from the Faculty of Medicine was the reason for this (11,17). The films *The Operation of spinal cord tumor* and *Pericardiectomy* which were shown in front of Mr. Wilson, director of the Photographic Institute received also positive comments in London.

Photo-Film Institute

The Photography Department was separated from the Institute of Histology in the spring of

Fotografsko odeljenje Aleksandra Kostića je sinonim za uvođenje i upotrebu fotografije i filma u nauku i medicinu. Činjenica da je ono živelo decenijama nakon Kostićevog udaljavanja sa Medicinskog fakulteta je dokaz koliko je bio ispred svoga vremena u razmišljanjima kada ga je uspostavljao i koliko je čvrste temelje postavio.

Zahvalnica

Neizmernu zahvalnost za pomoć u prikupljanju podataka prikazanih u ovom radu i stručnu pomoć i podršku autorke duguju dr Vesni Lačković, profesorki histologije i embriologije u penziji, dr Jeleni Jovanović Simić, višem kustosu Muzeja nauke i tehnike i Milanki Todić, profesorki istorije umetnosti u penziji. Zahvalnost za pomoć u pronalaženju podataka o postojanju i radu firme prof. Breslera duguju Milošu Jurišiću, fotografu Muzeja nauke i tehnike. Za pomoć u realizaciji procesa digitalizacije fotografskih staklenih negativa profesora Kostića duguju zahvalnost akademiku Aleksandru Kostiću, upravniku Audiovizuelnog arhiva i centra za digitalizaciju SANU i svim saradnicima AVA SANU.

Konflikt interesa

Autori su izjavili da nema konflikta interesa.

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1950 to form the Photo-Film Institute of the Great School of Medicine in Belgrade. At that time, more precisely from June 21st, 1948 to July 28th, 1954, three faculties – Medicine, Pharmacy and Dentistry, were separated from the University of Belgrade and organized within the Great School of Medicine, an institution at the level of a university (18). The aim of the Institute was to organize and carry out the entire photo-film activity of the Great School of Medicine in the field of teaching and scientific research, to follow the development of general and scientific photography and cinematography and to train young personnel for the photo-film service in medicine (3). Professor Kostić was appointed the manager of the Photo-film Institute. However, he was removed from the Faculty of Medicine in March 1952 due to political reasons, and Professor Mileta Magarašević was appointed to the position of manager. After Professor Magarašević, the Photo-Film Institute was led by Dr. Miodrag Mile Đorđević, then by Dragan Pantelić, before being returned to work within the Institute of Histology in 1998, on the initiative of Professor Vesna Lačković, then the director of the Institute of Histology. However, in January 2006, the Institute was closed (2). It happened due to the development of modern photographic technology, the availability of photography and videos via mobile phones, the availability of different photographic and film contents and the rapid exchange of data via the Internet.

The Photography Department, founded by Professor Aleksandar Kostić, had a historical role in the scientific and educational system of the Faculty of Medicine and its Institutes, especially for Histology itself. Kostić's contribution to the development of medical documentary photography is immeasurable and deserves special attention, because according to his own words, he "created the first photomicrograms in Yugoslavia, and among the first in Europe" at the Photographic Department of the Institute of Histology (19).

The Photography Department was also a pioneer of medical film in this region. Deeply aware of the significance of scientific films for the educational needs of medical students, as well as doctors, Professor Kostić, even after his removal from the faculty, continued to fight and advocate for their recording and introduction into practice through numerous texts that he published in foreign and domestic scientific journals, as well as in magazines almost until the end of his life (11,16,17,20).

Aleksandar Kostić's Photography Department is a synonym for the introduction and use of photography and film in science and medicine. The fact that it lived decades after Kostić's removal from the Faculty of Medicine proves how far ahead of his time he was when he founded it and how solid the foundations were.

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Competing interests

Authors declare no competing interests.

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