

PATHOLOGY AND LABORATORY MEDICINE AT THE AMERICAN UNIVERSITY OF BEIRUT

1866 - 2015

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“ In pathology, one spends the entire day working with one’s friends, one’s colleagues, **having a great deal of fun in the process.** The tremendous variety afforded by pathology, a field interfacing with all of medicine, is yet another attraction. **Pathology is a visual and intellectual experience unlike that in all the rest of medicine.** ”

Anonymous Author

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**PATHOLOGY
AND LABORATORY
MEDICINE AT AUB
AN 1866 - 2015 JOURNEY**

PATHOLOGY AND LABORATORY MEDICINE AT AUB AN 1866 - 2015 JOURNEY

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“ In a word, the purpose of the College is not to produce singly or chiefly men who are doctors, men who are pharmacists, men who are merchants, men who are preachers, teachers, lawyers, editors, statesmen; but it is the purpose of the College to produce doctors who are men, pharmacists who are men, merchants who are men, preachers, teachers, lawyers, editors, statesmen who are men. ”

Howard Bliss, President of SPC, 1911

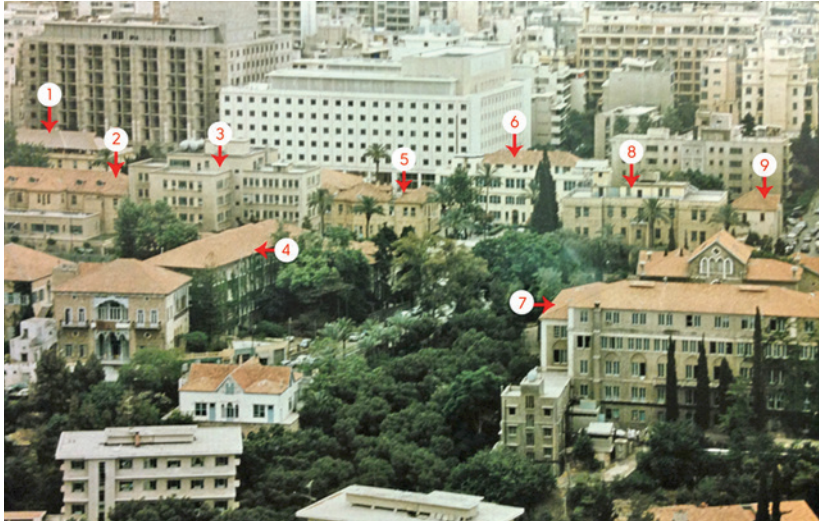
Introduction

From the early days of founding the Syrian Protestant College (SPC) in Lebanon by American missionaries in 1866, pathology and laboratory medicine have been essential components and integral parts of its programs in medical education and clinical practice. The School of Medicine, originally known as the “Medical Department”, was established in 1867 and from the outset, the Founding Fathers and the Trustees were keenly aware of the necessity for the College to have its own campus and teaching hospital. As neither was available, the College started out in rented premises in the Zokak El-Blat district of Beirut. A small building adjoining the school was set up as a clinic and hospital of about eight beds. This was clearly recognized as a makeshift arrangement until more satisfactory hospital facilities become available. It is unlikely that a laboratory existed in such a set-up. This clinic and hospital were abandoned in 1871 when an “affiliation” agreement was made between the College and Johanniter Hospital (the Prussian Hospital), built by the Knights of the Order of St. John, whereby the clinical teaching would be conducted at that hospital.



The Johaniter Hospital on a postcard from 1918

The Prussian Hospital was fairly well equipped, housed more than eighty patients, and was only five minute walk from the new campus to which the College would move to in 1873. The hospital had a laboratory equipped with microscopes, centrifuge, chemical reagents and few other appliances. Autopsies were also performed at the hospital. The agreement between SPC and the Prussian Hospital was terminated on January 2, 1918, by order of the Ottoman Sultan because USA entered the war against Germany and its ally, the Ottoman Empire. With the advent of the French mandate in Lebanon, the French authorities seized the hospital as war bounty, turned it into their own military hospital, and renamed it Hopital Militaire Maurice Rottier. It remained as such until the end of 1946 when French troops withdrew from Lebanon. However, the property remained French; it has since been used to house the French embassy and, more recently, the Ecole Supérieure des Affaires (ESA). From the outset, the College wanted to have its own hospital and in the summer of 1902, it purchased the Adham (Azm) property which lay south and east of the medical gate. This, added to a small plot already owned, provided a sizable area for future hospital buildings. The new property included a very large house (palace) which was remodeled and served as administration building, superintendent's and head nurse's home, the pupil nurse's home, the kitchen, and wards for gynecology and obstetrics, children's diseases, and two beds allocated to dermatology. In addition to the palace, there were three small buildings that would be put to good use by the future hospital.



The AUB Medical Campus in the early 1970s: 1. Dale Home, 2. Women's (1908) and Pediatrics (1910), 3. Building 56 (1954), 4. OPD Building, 5. Surgery Wing, 6. Pathology Building (1925), 7. Van Dyck Building (1932), 8. Medical Wing-AUH, 9. Residence for administration/staff.

Beginning in 1904, an active building program began; funds were raised and construction began after the necessary permits were obtained. The first facility designed and built as a hospital owned by SPC was the Women's Pavilion (1908), followed by the Eye Pavilion (1909), the Children's Pavilion (1910) and the Hospital Gate. One of the small buildings was used for the polyclinics consisting of nine rooms: three examining, three demonstration and three waiting rooms. The mortuary was set up in one of the other buildings. Later on, other buildings were built thanks to various grants: Dale Home, to house the School of Nursing and dormitories, was built in 1924; the Pathology building in 1925, the former Out Patient (OPD) building, in 1932; and the "New Wing" commonly known as "Building 56" in 1954. By this time, the hospital capacity had risen to two hundred twenty beds distributed in different pavilions (Internal Medicine, Surgery, Obstetrics and Gynecology, and Pediatrics). Of the old buildings, only three remain in use at the time of this writing: Building 56, Dale Home (the old Nursing School building) and the old OPD building (currently building 23 or Pierre Y. Abou Khater (Fahed) building). The present Medical Center was inaugurated in June 1970. The Adham (Azm) house was destroyed by fire on December 30, 1939. At the time of its destruction, it housed hospital administration, medical records, and living quarters of the interns. Fortunately no one was injured and only part of the patients' records was totally destroyed.

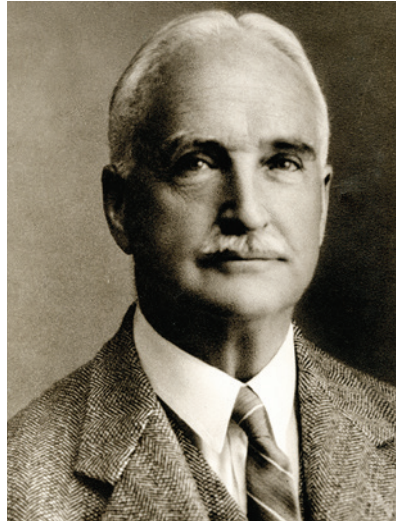
THE FOUNDING FACULTY AND THE DEPARTMENT THAT FOLLOWED



Front L to R: Dr. Cornelius Van Dyck, Reverend Daniel Bliss, Dr. John Wortabet;
Rear L to R: David S. Dodge, Dr. George E. Post, Dr. Edwin R. Lewis, Dr. Harvey Porter



Dr. Harris Graham



Dr. Harry G. Dorman

The Founding Faculty and the Department that Followed

At the very beginning, the College had only two "departments": the Literary and the Medical. The Medical department later became the School of Medicine and, more recently, the Faculty of Medicine and Medical Center. There were no academic departments as known today and instruction was on AUB campus in the Medical Hall where most of the teaching took place. The Hall was put to use in 1873 and consisted at that time of two amphitheaters for lectures and demonstrations, two recitation rooms, bacteriological and physiological laboratories and rooms for anatomical, surgical and pathological collections. The pathology museum is mentioned in the catalogues beginning with the year 1880. Today the building houses the Regional External Program of the University.

Originally, three professors taught all medical courses; these were Cornelius Van Alen Van Dyck, MD, Professor of Internal Medicine and General Pathology (Professor of Theory and Practice of Medicine) and provisionally Ophthalmology (1867 - 1882), John Wortabet, MD, Professor of Anatomy and Physiology (1867 - 1882) and lecturer in Pathology and Practice of Medicine (1882 - 1885), and George Edward Post, MD, Professor of Surgery, Materia Medica and Botany.



Dr. Nimeh Nucho



Dr. Nejb Ardati

Dr. Van Dyck, the first professor of pathology, resigned from the College in December 1882 in a stand off between faculty and administration over the teaching of Darwin's theory of evolution. Dr. Calhoun briefly covered for him and later Dr. Wortabet accepted to take on the additional load of pathology teaching. A few months later, Dr. Charles Dight was appointed professor and chair of Pathology and Practice of Medicine; he served for six years (1883 - 1889). Instruction of the medical curriculum was shifted from Arabic to English in 1883. Dr. Harris Graham followed Dr. Dight in 1889. He was appointed as Professor of Pathology, Bacteriology and Practice of Medicine. He remained in that post until his death in Beirut on February 27, 1922. He also held the title of Pathologist to the Johanniter Hospital.

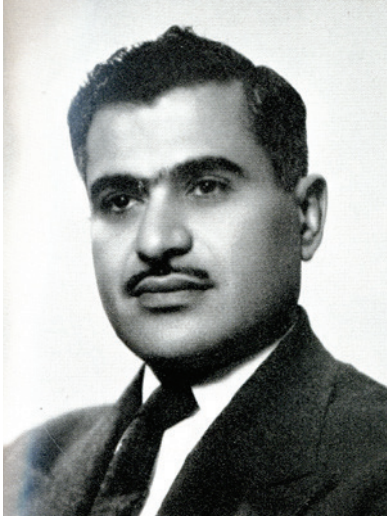
During the period between 1900 and 1920, eight faculty members were appointed at different academic levels and for varying periods; some were SPC graduates: Harry G. Dorman, MD, Professor of Histology, General Pathology and Pediatrics (1903 to 1910); Nimeh Nucho, MD (SPC), Assistant in Histology and General Pathology (1904 - 1912); Nechan Hampartsumian, MD(SPC), Clinical Assistant to the Professor of



Dr. Krikor S. Krikorian

Pathology (1904 - 1905); Nikula Constantine Rubeiz, MD (SPC), Clinical Assistant in Pathology (1907), Nejib Ardati, MD (SPC), Clinical Assistant to the professor of pathology (1907 - 1908), Hospital Pathologist, and Instructor in Bacteriology (1908 - 1913); Suleiman Salibi, MD (SPC), Bacteriologist in College Hospitals (1913 - 1914); Hovsep Yenikomshian, MD (SPC), Hospital Pathologist and Instructor in Materia Medica, (1918 - 1921); Adjunct Professor Elect of Internal Medicine and Hospital Pathologist (1922 - 1923); and Harry G. Thomas, MD, Adjunct Professor Allenby Foundation in charge of courses in General Pathology, Physical Diagnosis and Hygiene (1920 - 1922).

In the academic year 1920 - 1921, SPC became the American University of Beirut (AUB) and the organizational structure changed from one department for the whole school as known since 1867 to many departments. One of the newly established departments was the department of "Bacteriology, Pathology, Hygiene and Parasitology" and the Pathology building was built in 1925 to accommodate it. Ample space became available for classroom work, teaching, service, research, a reception area for ambulatory patients, as well as a hundred-seat amphitheater,



Dr. Raif Nassif



Dr. Farid Khoury

a museum, mortuary and the necessary support services. In 1929, the department was split into two departments: Pathology on one side, and Bacteriology, Hygiene and Parasitology on the other. In 1936, Hygiene was taken out and the department became department of Bacteriology and Parasitology. This department was responsible for supervising the clinical laboratories for both inpatient and outpatient work until 1949 when a separate hospital based Department of Laboratory Studies was created with Dr. Krikor S. Krikorian (MD, SPC 1915) as its first director. Dr. Krikorian held this position until his death in 1957 and Dr. Raif Nassif succeeded him. In 1958, the Department of Clinical Pathology was founded; it was headed by Dr. Raif Nassif until 1966 at which time Dr. Farid Khoury served as acting chair followed in 1969 by Dr. Samih Alami who became acting chair and shortly thereafter chair. The name of the department was changed to Department of Laboratory Medicine in 1978. Most recently and in 1996, the two departments Pathology and Laboratory Medicine were combined and became the Department of Pathology and Laboratory Medicine with Dr. Ghazi Zaatari as chair.

PATHOLOGY TEACHING

Pathology Teaching

“ We do not attempt to force a student to absorb a definite quantity of knowledge, but we strive to teach him how to study. We do not pretend to give a complete course of instruction in four or five years, but rather to encourage the habit of study, as foundation for an education as long as life itself. ”

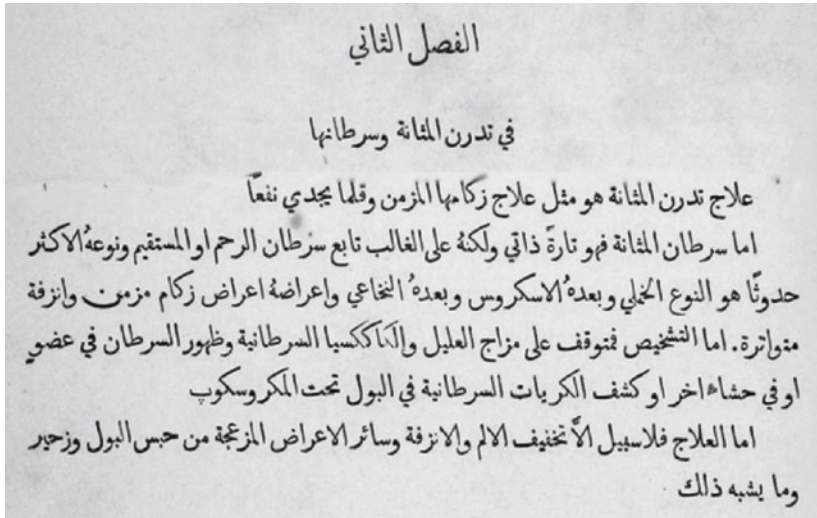
Bayard Dodge, President, AUB, 1920

Dr. Van Dyck was amongst the founding faculty of SPC and from the early days, he assumed the responsibility of teaching pathology and medicine. He was a Renaissance man, had interest in medicine, astronomy, math and theology; he authored several books in English and Arabic, some of which were used for teaching medicine. He was commonly referred to by his students as “al-hakeem” (the wise man). An original copy of a 779 page book handwritten in Arabic, authored by Dr. Van Dyck and entitled “اصول الباثولوجيا الداخلية الخاصة أي مبادئ الطب البشري النظري والعملي”

“Basic Principles of Internal Pathology i.e. Theoretical and Practical Principles of Human Medicine” is available at Jafet Library dating back to 1867. Its title reflects the thinking of the day, which still holds until today, in that learning pathology is essential for good understanding of the basis of disease and allowing the best practice of medicine. The book is divided into three parts: Part I covers general pathology principles, part II covers classification of diseases, and Part III covers specific medical diseases. In the latter part, there is inclusion of definition of disease, clinical signs and symptoms and where applicable, there is pathology description of the disease based on autopsy or tissue examination. Treatment was also covered in this part of the book. In some sections, there is mention of in vivo testing and chemical analysis in diagnosing disease. Interestingly, there is a sizeable section of the book on the microscopic and chemical analysis of urine in several diseases and the section on diseases of the blood includes microscopic descriptions of leukemia cells in peripheral blood.

Over time, there were updated revisions of this book with expanded discussions and additional descriptions to its sections; a printed copy of the revised book, dated 1878 is available at the Saab Medical Library.

During the first two decades of the 20th century, the teaching of pathology was administered as general pathology during the second year followed by systemic pathology during the third and fourth years. In 1911, pathology was taught in the second and third years. Instruction was through lectures,



Basic Principles of Internal Pathology i.e. Theoretical and Practical Principles of Human Medicine – Printed in 1878.

This chapter on urinary bladder cancer describes clinical features, diagnosis and treatment. The author refers to the detection of cancer cells by microscopic examination of urine, a novel concept for its day.

recitations and laboratory sessions. A museum and slide set were available for that purpose. The museum included 185 specimens of fractures, dislocations, necrosis, caries, otitis and rachitis, tumors preserved in alcohol, foreign bodies, vesical, urethral, renal and ureteral calculi, and wax models of various diseases. Of note, Roentgen ray apparatus was available then for radiographs. Early in the century, Osler's textbook was used for teaching pathology and medicine and was later replaced by Dorman's textbook. Bacteriology was taught during the senior fourth year.

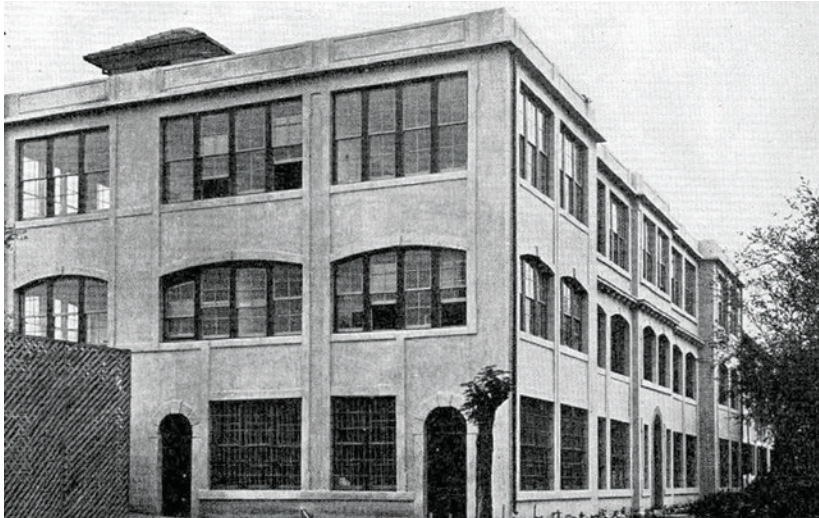
In 1915, the medical curriculum was extended from 4 to 5 years and the fifth year was devoted to practical clinical work as per Ottoman rule. General pathology was covered during the second year and the number of lectures ranged over the years between 96 to 128 lectures and recitations and 128 to 160 hours of laboratory sessions referred to as morbid histology. The reference books were McCallum, General Pathology textbook for the lectures and Greenbaum, The Essentials of Morbid Histology, for the laboratory sessions. Additional pathology teachings were offered as surgical (systemic) pathology in the third year (16 lectures and 32 lab sessions hours) and tumor pathology in the fourth year (16 lectures and 32 lab sessions hours). Additional pathology textbooks were recommended for the purpose of these courses and included:



Surgical and Pathology Museum in Medical Hall, Syrian Protestant College

Adami and McRae Textbook of Pathology; Ewing, Neoplastic Diseases; and Delafield and Prudden, Textbook of Pathology. For years, McCallum and Greenbaum textbooks were used as the major pathology reference books but in 1945, W. Boyd, Textbook of Pathology, was recommended. In 1924, the curriculum included a laboratory course running throughout the year designed to familiarize the students with the fundamental and more advanced aspects of bacteriology, clinical microscopy, serology, pathological chemistry, pathology, clinical physiology and röntgenology. The recommended book was Todd, Laboratory Guide to Diagnosis. Such instruction was deemed necessary for the curriculum and for the fact that students were expected to perform few laboratory tests on their patients.

The new Pathology building was inaugurated in 1925; this offered the department improved teaching facilities. In that year, Dr. Pierre Lepin, from Université de Lyon, served as chair for one year and managed to entirely reorganize the museum, introduce new classification, and add new specimens to it. Shortly thereafter, the building had to be redesigned to accommodate the needs of the expanded Department of Bacteriology, Parasitology and Pathology. A good credit in the redesigning of the building went to Dr. Harald Krischner, from the University of Graz, Austria, who oversaw many phases of that redesigning but sadly his tenure was short and he succumbed to septicemia acquired while performing an autopsy in 1931. The building was considered a monument to his memory. It housed a



The Pathology building, built in 1925

Pathology Museum, an amphitheater of 100 seats for lectures and demonstrations, offices and research facilities for all three disciplines, an autopsy room and morgue. The roof housed the animal quarters and animal operating room.

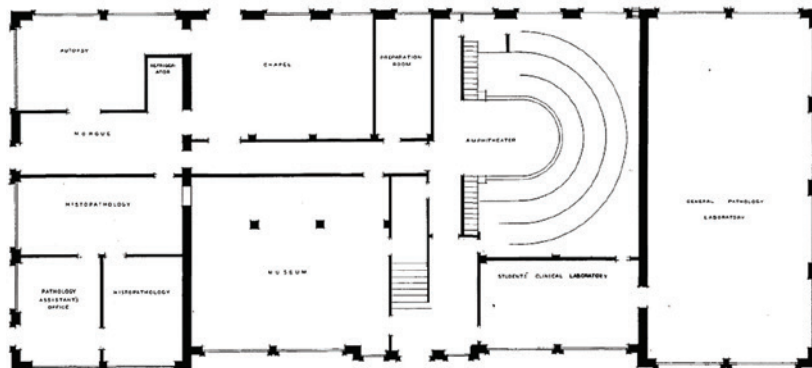
One highlight of pathology and medical teaching for decades (from the 1920s until the late 1960s) was a weekly Clinicopathologic Conference (CPC). Attendance of the CPC was a requirement for the medical students in their third, fourth and fifth years. It was mostly held on Saturdays at noon and it attracted a large number of medical staff, residents and medical students. On few occasions, visiting professors were asked to take part in these weekly educational exercises. Over time, the number of these conferences dropped and in 1958 was reduced from 32 per year to 16; despite the drop in the autopsy rate, surgical pathology material was used as alternative source of pathology material as the case was worldwide with this instructive educational activity. The proceedings of many of these CPC were published in the Lebanese Medical Journal. In addition, interdepartmental conferences (tumor conference, surgery, medicine, and gynecology) were held as weekly activities by the Department in coordination with other clinical departments and some served as requirement to students in their clinical years. Some of these multidisciplinary activities assumed the role of CPC in teaching. Holding CPC as a required course of the curriculum ceased in 1970.



Dr. Harald Krischner

As in years past, the pathology course was taught mostly during the second year as lectures followed by lab sessions. In 1954, the curriculum was more consolidated into the second year and the number of lectures was increased from 64 to 96 and the laboratory sessions became 192 hours. Because of the shortage of faculty in pathology, members of other departments such as Internal Medicine and Gynecology took part in lecturing. A set of about 250 slides (later increased to 350) was made available to the students for the purpose of the laboratory sessions. A museum for gross specimens was available but the gross specimens were not well kept by that time. In 1953, multiple choice questions were offered for the first time in the pathology exams. Anderson Textbook of Pathology was the recommended book during this period.

In 1969 and following a faculty retreat in Laklout, it was agreed to integrate the teaching of pathology with the Introduction to Internal Medicine during the second year. This was the practice at the Faculty of Medicine until 2014 and the pathology course was covered in 108 lectures and 72 laboratory hours. In 1971 and through his prior affiliation with the Institute of Pathology of Freiburg, the newly appointed professor and chair, Dr. Harald Noltenius, was able to obtain 450 gross specimens from that institution to enrich the teaching collection of the pathology museum. With the inauguration of the new medical center in 1970, teaching of pathology was moved to the second floor of Phase I but with the inauguration of the Diana Tamari Sabbagh building on the main AUB campus in February 1975, teaching of medical students for all preclinical years, including pathology, was relocated to that building.



The Pathology building, ground floor plan showing space for laboratories, amphitheater, museum and morgue.

Laboratory sessions of the pathology course were conducted in a multidisciplinary lab on the second floor. It housed the museum of the gross specimens and was equipped with a microscope and 4 monitors for projection of educational material and images. From the 70s on, the recommended book has been Robbins Pathologic Basis of Disease. In its later editions, this classic textbook, one of the most widely read textbooks in pathology and medicine worldwide, was co-edited by the late Dr. Ramzi Cotran, a Professor of Pathology at Harvard University and a 1956 medical graduate of the American University of Beirut. In the academic year 2013 - 14, the medical curriculum underwent major revision and there has been integration of all basic medical sciences (biochemistry, physiology, anatomy, histology, pharmacology, microbiology, immunology, and pathology) and introduction to internal medicine into several multidisciplinary blocks that are taught over the first two years of medical education. For pathology laboratory sessions teaching, there will be also a shift from the traditional microscopy to virtual microscopy where a slide bank and images will be created to meet the evolving educational needs and making use of the rapidly evolving technological tools in teaching.

Clinical pathology was taught as a course during the second year; the instruction was offered in 16 lectures and 64 hours of lab sessions. In 1956, these numbers were dropped to 20 hours of lab instruction only, later increased to 32 in 1959, then to 16 hours of lectures and 32 hours of lab sessions in 1966, and discontinued totally in 1969 and the material was to be incorporated in other interdepartmental teachings.



Fetuses from the gross specimens museum installed by Harald Noltinius

For postgraduate training, this was not a strong area of the Department in its early days and it did not attract many graduates who were willing to go into this specialty. Of these, there were two noted graduates who rejoined the Department after completing their initial training at AUB and then traveling abroad for more training before rejoining AUB. Dr. Nimr Tuqan (resident 1950 - 52, instructor 1952) and Dr. Latifeh Ghandour (resident 1955 - 58; left for USA 1958 and returned as assistant professor in 1961). The 70s witnessed better structured three year training programs in anatomic and clinical pathology but the civil war in the country disrupted them drastically. To cover teaching adequately, the Department had to rely on faculty from other departments as well as visiting professors from abroad. However, the recovery of relative peace and tranquility in the country in the 90s attracted several faculty members who had their training abroad and were willing to rejoin the alma mater and thus contribute greatly to the rebuilding of a strong and unified department of Pathology and Laboratory Medicine in all its three arms—teaching, service and research—and consequently two well structured postgraduate training programs in anatomic pathology and clinical pathology which attracted many graduates. In the late 1990's, residents were required to sit annually for the Resident In-Service Exam (RISE) offered by the American Society for Clinical Pathology. Graduates of these two postgraduate programs have either joined the workforce in the country or traveled abroad, most commonly to USA, for additional training.

SERVICE
MEDICINE IS SCIENCE
AND SERVICE

Pathology Service

الطب علم وعمل

Medicine is science and service

Before the Pathology building, laboratory work was done manually; in each pavilion, a room where simple qualitative and semi quantitative tests were performed by the students and in one of the small buildings near the hospital pavilions, there was a main laboratory for microscopy and the more advanced analytical tests. This lab catered to inpatients and outpatients. At first, all the service laboratories were located in the new Pathology building for easy supervision by the department of Bacteriology Parasitology or Pathology as the case may be (bacteriology, parasitology/ clinical microscopy, and serology under the supervision of the department of Bacteriology - Parasitology, and hematology under the supervision of the department of Pathology). Only the clinical chemistry lab was located in Van Dyck Hall under the supervision of the chairman of the department of Biochemistry. The clinical chemistry lab moved to the Pathology building with the appointment in the department of Clinical Pathology of a Hospital Biochemist. It was only in 1949 that supervision of all sections became the responsibility of the newly established Department of Laboratory Studies later known as the Department of Clinical Pathology and later Department of Laboratory Medicine. From its very beginning, the Department always aimed at excellence and spared no effort towards that end. Essential new equipment was obtained as soon as possible and, at times some was home-built pending the availability of funds for its purchase. There were serious shortages in many items during the Second World War. The department met the challenge head on: adequate quantities of spare parts were stocked and came to the rescue quickly when needed. Vaccines (e.g. TAB, small pox, cholera, plague) that were in short supply were prepared locally and the practice for some was continued until the early 1970s.

From 1925 until 1970, the Department of Pathology had a sustainable and continued growth in its service despite the fact it was mostly run by skeleton full-time and few visiting faculty members; the period between 1945 until 1969 was dominated by the leadership of Dr. Philip Sahyoun who in 1923 started his career as instructor in the Department of Bacteriology, Pathology, Hygiene & Parasitology and over the years moved up the ranks to a professor. Because of the stature and reputation of the American University Hospital in the region, the pathology lab attracted specimens from several countries in the region such as Syria, Iraq,



Dr. Philip Sahyoun

Jordan, Palestine, Saudi Arabia, Kuwait, Pakistan and Iran. Oil companies, such as Iraq Petroleum Company (IPC), Trans Arabian Pipeline Company (Tapline), relied on AUH for the healthcare of its employees and so did UNRWA for the care of the Palestinian refugees. The department has records of autopsies dating back to November 1, 1922 and to hand written surgical pathology reports dating back to March 1, 1923. As for technical matters, embedding tissues in paraffin was already a long standing practice in the department by that time and intraoperative frozen section service were being offered as part of the clinical service. Indexing system for surgical pathology cases was introduced in 1953. Cytopathology service was also introduced in 1953 but was originally under the supervision of the Department of Obstetrics and Gynecology for one year before turning it over to pathology. Of note here is the fact that Dr. Edith Sproul served on the faculty of the department for few years and she is credited for working with Dr. George Papanicolou of the Cornell University Medical School in New York City who pioneered the development and use of the pap smear for screening for cervical cancer. In the early 1950s autopsies were performed at a rate of 40% of hospital deaths but this dwindled to 15% by 1970 and progressively less thereafter. A postgraduate training program in pathology was offered but the interest was very low amongst AUB graduates and most of the trainees were residents in surgery who were required to spend 4 month rotations in pathology as



Dr. Edith Sproul

part of their overall surgery training. During that era, the financial status of the Department was repeatedly a source concern to Dr. Sahyoun and the following statement by him in 1957 reflects the long standing ethical, social and educational priorities of the Department: "The Department is still convinced, as in the past, that a policy of reasonable tolerance with regard to the examination fees of specimens is inevitable. This applies particularly, to outside cases and some charity institutions. This is necessary as one means of expressing the importance of this diagnostic method. It is a part of the academic and ethical duties of this Department in this area. For this reason, the Department examines quite a number of specimens at reduced rates or gratis."

In 1969, automated tissue processing was introduced to the surgical pathology service. In addition, new recommendations were introduced to the cytology service such as using heparin for fluids and combining cervical and vaginal smear in one rather than two smears. During the same year, Dr Jean Rebeiz joined the Department and was instrumental in introducing neuropathology services to the medical center. Dr. Janine Tomb also joined at the same year as research associate and during her tenure at AUB, she focused on enhancing the cytopathology services of the department and for that purpose, she was supported for short term training abroad at Karolinska Institute in Sweden and Johns Hopkins



Dr. Ramez Azoury

Hospital in Baltimore. The inauguration of the new medical center in 1970 presented the department with more spacious diagnostic facilities and modern technologies. The Department occupied the third floor of phase I and part of phase II. The autopsy room was located on the third floor of phase II and the morgue was on the ground floor of the medical center.

In 1970, Dr. Ramez Azoury joined the Department; he had joint appointment in the Department of Obstetrics and Gynecology and his service work in pathology focused on gynecologic pathology. The Lebanese Civil War of the mid 70s led to the departure of most pathologists and the pathology service was shouldered by skeleton staff and the coverage of the pathology service was salvaged by the joining of the Department by Dr. Charles Allam, a member of the Department of Laboratory Medicine. Since the early 1990s there has been recruitment of several faculty members and this has progressively alleviated these pressures and led to much improved services. At the new Medical Center, AUBMC, the Department of Laboratory Medicine occupied its current home on the third floor of phase II of the Medical Center. The services were directed by Dr. Raif Nassif and later by Dr. Samih Alami who were instrumental in modernizing the clinical laboratories at AUBMC and establishing the multiple units within the Department for the various disciplines of clinical pathology (laboratory medicine) – Blood



Dr. George Abu Haidar



Dr. Samih Alami

Bank, Clinical Microbiology, Clinical Chemistry, Clinical Hematology and Cytogenetics. In 1996, the two departments of Pathology and Laboratory Medicine were merged and since then, there has been further expansion of the clinical laboratory services with the establishment of more diagnostic units such as molecular pathology in 2004 and the Muhieddine Al-Ahdab Neuromuscular Laboratory in 2008. The latter occupied the autopsy suite which was relocated to the ground floor next to the Morgue. This specialized lab introduced new diagnostic tools in the study of muscle and nerve disease. The ambulatory services of the Laboratory were also relocated from the third floor to the ground floor of the medical center in 2006 to accommodate the sharp growth in the ambulatory services where up to 400 patients are handled on daily basis. In October 2008, an additional ambulatory laboratory service was established on the ground floor of Building 23 (Pierre Y. Abou Khater (Fahed) building).

In the new medical center and in 1970, the Department of Internal Medicine housed the Endocrinology Laboratory on the fifth floor of phase I. It was originally under the directorship of Dr. Najib Abu Haidar, head of the endocrinology division and later under the directorship of Dr. Ibrahim Salti but in coordination with the Department of Laboratory Medicine and later with the Department of Pathology and Laboratory



Van Dyck building, inaugurated in 1930 - Source: REN_A_006, Raif Nassif collection, Phoenix center for Lebanese studies, Holy Spirit University of Kaslik (USEK).

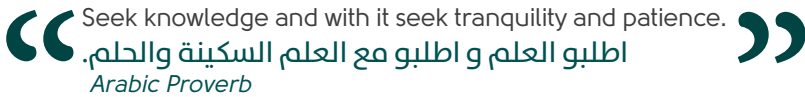
Medicine. Much of the testing in the endocrinology lab utilized radioimmunoassay technology and it covered a long menu of hormonal tests. With the introduction of new technologies and the safety restrictions on the use of radioactive substances, the endocrinology tests were gradually integrated into the main Clinical Chemistry Laboratory starting in 2008.

Over all these years, the Department was instrumental in introducing state of the art technologies into Lebanon and thus set standards for practice in the country and many countries of the region. A few of the "first in Lebanon" and perhaps in the Near East in the recent past can serve as illustration: Blood Bank, Clinical Chemistry (flame photometer, endocrinology laboratory, continuous flow analyzer, fully automated random access analyzer, amino acid analyzer, gas chromatography for amino acid analysis, determination of intermediary enzymes of metabolism for inborn errors of metabolism, and antenatal screening in maternal serum), Pathology (histopathology, automatic tissue processor, cytopathology, immunohistochemistry and neuromuscular lab), Cytogenetics (tissue culture and prenatal karyotyping), Quality Control and Quality Assurance Program, and Accreditation by the College of American Pathologists (CAP).



RESEARCH AND INVESTIGATIVE WORK

Research and Investigative Work



In the early days of the College, the focus of the Medical Department was on teaching and service; it is only with the establishment of departments as we know them today that there has been increasing interest in investigative scholarly work and research. For a long period, the Department of Pathology had only one or two faculty members and thus much of the investigative work was done in collaboration with faculty members of other departments. Most of the publications were case reports but from the late 1950s and afterwards, there was more original and collaborative research work, mostly led by Dr. Tuqan, on topics such as periodic diseases, profile of malignancies in the region, mechanisms of atherosclerosis, thyroid pathology and histochemical studies. Dr. Latifeh Ghandour had special interest in bone pathology and made original contributions to the pathology of giant cell tumors of bone; some of this work was done in collaboration with her spouse, Dr. Walid Mneimneh, who was an orthopedic surgeon at AUBMC. With the recruitment of Dr. Jean Rebeiz and his interest in neuropathology, a neuromuscular research lab was established which led to several original publications on a variety of neuromuscular disorders. Some of this work was done in collaboration with US investigators with whom Dr. Rebeiz had his training. Dr. Noltinius established a core of researchers that were interested in immunopathology; he attracted funding from Germany and thus introduced new research tools such as autoradiography, cell culture, ultracentrifugation, assay and isolation of antibody forming cells and measuring radioactivity which allowed him to carry on with his work on studying and characterizing antibody forming cells. Many of Dr. Noltinius publications appeared in the German literature. Because of political instability in Lebanon and the region, his tenure was short and he returned to Germany in 1973. Subsequently he published a 4 volume book titled "Human Oncology" which he dedicated to AUB medical students. Other faculty members carried on with their research work; of note is the work of Dr. Victor Nassar, in collaboration with Dr. Alami and other clinical faculty, on intestinal lymphomas with emphasis on the immunoproliferative disorders of the intestinal tract and the so called "Mediterranean lymphoma". In their collaborative work, Dr. Farid Khoury and Dr. Nassar highlighted the importance of karyotyping in



Dr. Harald Nolténus



Dr. Jean Rebeiz

diagnosing malignant lymphoma. Dr. Alami had lifelong interest in studying serum paraproteins and their clinical significance. Ironically, he died of this disease.

The Lebanese civil war of the mid 70s took a major toll on the department which became much depleted of its faculty and consequently no substantial investigative work was conducted until the early 1980's which witnessed the recruitment of new faculty members such as Dr. Amjad Mufarrij, Dr. Patrice Hassoun, Dr. Amira Mansour and few others for short intervals. Dr. Mufarrij had special interest in kidney diseases, inflammatory disorders and amyloidosis. He coauthored with his AUB colleagues a book on "The Kidney in Genetic Disease (1986)". Dr. Mansour had several publications on the experience at AUBMC with selected pediatric tumors. The recruitment of more faculty members in the 90s and the merger of the two departments of Laboratory Medicine and Pathology contributed to a sharp rise in research funding and publications over the past 15 years. Many of the new recruits had subspecialty training abroad and this contributed greatly to the academic environment and activities of the Department. Dr. George Araj had numerous original publications in clinical microbiology, Dr. M. Zouhair Habbal and Dr. Rose Daher in clinical chemistry and biochemical

genetics, Dr. Laila Zahed in cytogenetics and descriptions of selected genetic disorders such as hemoglobinopathies, Dr. Elizabeth Baz in blood banking and transfusion medicine, Dr. Ayman Tawil in surgical pathology and gastrointestinal pathology, Dr. Nina Shabb in cytopathology and in more recent years, Dr. Rami Mahfouz in hematopathology, immunopathology, and molecular pathology, Dr. Mirelle Kattar in molecular microbiology, Dr. Fouad Boulos in breast diseases, Dr. Chantal Farra in molecular genetics, Dr. Ibrahim Khalifeh in dermatopathology and original collaborative work on leishmaniasis and pigmented melanocytic lesions, and Dr. Ghazi Zaatari in surgical pathology, hematopathology, immunopathology and molecular pathology. The department had multiple fruitful collaborations with investigators from other departments and these efforts contributed to the development of animal models of disease as in the murine model of lung injury secondary to oxygen toxicity, cigarette smoke and e-cigarette vapor, and HTLV-induced hematological malignancies and other hematological malignancies. As it stands in 2014, the research funds have amounted to \$ 700,000 covering 30 research grants done independently in the department or jointly with collaborators outside the department.

THE FUTURE

The Future

“ The future of the medical students and the Faculty of Medicine at AUB are entrusted to us, the faculty, and no one else. We should not allow anything that would jeopardize this trust. ”

George Fawwaz

Professor and Chair of Pharmacology

Since the founding days, the Department of Pathology and Laboratory Medicine has achieved several milestones in education, service and research and will continue to aspire to more future accomplishments. At the time of this writing, the Department has grown to 18 full time faculty members and all hold subspecialty training with active research in their respective areas of interest. The faculty are deeply engaged in teaching and clinical services; they cover a well-structured course in pathology and several courses of the Medical Laboratory Sciences Program of the Faculty of Health Sciences, participate in the restructuring of the new medical curriculum, and run state of the art laboratory services in anatomic and clinical pathology operated by highly skilled technologists and staff according to the best international standards. Today, the clinical services handle more than 12,000 surgical pathology and 13,000 cytopathology specimens per year and perform close to 2 million clinical tests per year. The Department plays a pivotal role in promoting continuous medical education in pathology through its weekly conferences, conducting periodic educational activities, and collaborations with the Arab Division of the International Academy of Pathology, and was instrumental in launching the Arab School of Pathology.



Department of Pathology and Laboratory Medicine Faculty - 2014

It oversees two robust programs in postgraduate training in anatomic pathology and laboratory medicine and has been instrumental in establishing the Arab Board of Pathology under the auspices of the Arab Board of Health Specializations. As AUB and its Faculty of Medicine and Medical Center launch the Vision 2020 development program, the Department is well positioned to carry on with the long standing standards of excellence, set early on by the forefathers of the department and the institution.



Appendix

Pathology- Laboratory Medicine Faculty

(In chronological order by year of first appointment)

The founding faculty

- Cornelius Van Alen Van Dyck, MD: 1867 - 1882, Professor of Internal Medicine and General Pathology and, provisionally, Ophthalmology.
- John Wortabet, MD: 1867 - 1882, Professor of Anatomy and Physiology; 1882 - 1885, Lecturer in Pathology and Practice of Medicine.
- George Edward Post, MD: 1868 - 1909, Professor of Surgery, Materia Medica, and Botany.

Faculty prior to 1920

- Charles Dight, MD: (1883 - 1889) Professor of Pathology and Practice of Medicine.
- Harris Graham, MD: (1889 - 1922) Professor of Pathology, Bacteriology and Practice of Medicine, (died February 27, 1922).
- Harry Dorman, MD: (1903 - 1910) Professor of Histology, General Pathology, and Pediatrics. Later Obstetrics & Gynecology.
- Nimeh Khalil Nucho, MD: (1904 - 1912) Assistant in Histology and General Pathology.
- Nechan Hampartsumian, MD: (1904 - 1905) Clinical Assistant to the Professor of Pathology.
- Nikula Constantine Rubeiz, MD: (1907) Clinical Assistant in Pathology.
- Nejib Ardati, MD: (1907 - 1908) Clinical Assistant to the professor of Pathology; (1908 - 1913) Hospital Pathologist and Instructor in Bacteriology (1925) Professor of Public Health and Hygiene and instructor in Clinical Microscopy.
- Suleiman Salibi, MD: (1913 - 1914) Bacteriologist in College Hospitals.
- Hovsep Yenikomshian, MD: (1918 - 1921) Hospital Pathologist; Hospital Pathologist and Instructor in Materia Medica; (1922 - 1923) Adjunct Professor Elect of Internal Medicine and Hospital Pathologist.
- Harry G. Thomas, MD: (1920 - 1922) Adjunct Professor (Allenby Foundation) in charge of courses in General Pathology, Physical Diagnosis and Hygiene.

Faculty since 1920

- William T. Van Dyck, MD: (1922 - 1923) Professor of Zoology, Physiology and Parasitology.
- Yervant Djanian, MD: (1922 - 1924) Instructor in Parasitology.
- William D. Cruikshank, MD: (1922 - 1925) Professor of Pathology. Later Surgery.
- Leland W. Parr, MD: (1923 - 1930) Associate Professor of Bacteriology and Hygiene.
- Raif Shadid Bellama', PhD: (1923 - 1924) Lecturer in Tropical Medicine, Pathologist for Outpatient Department; (1924 - 1926) Adjunct Professor of Parasitology, Lecturer in Tropical Diseases, Instructor in Clinical Microscopy; (1926 - 1927) Director of Hospital Laboratory; (1933 - 1938) Adjunct Professor of Clinical Pathology.
- Philip Sahyoun, MD: (1923 - 1940) Instructor and then Adjunct Professor of Pathology and Assistant Director of Hospital Laboratory; (1940 - 1945) Associate Professor of Pathology; (1945 - 1969) Professor and Chairman, Pathology Department.
- Miss Marjorie Webster: (1923 - 1925) Hospital Bacteriologist.

Departments Created

1. Department of Bacteriology, Pathology, Hygiene and Parasitology, 1920
 - William Topous Khan, MD: (1924 - 1925) Lecturer in Pathology and Morbid Anatomy.
 - Pierre Lepine, MD: (1925 - 1926) Adjunct Professor of Pathology, Chairman.
 - Raymond Goodale, MD: (1926 - 1927) Adjunct Professor of Pathology and Laboratory Director.
 - Ellen E. Porter, MS: (1925 - 1927) Instructor in the Clinical Laboratory of the Hospital.
 - Margaret Avery: (1926 - 1927) Instructor in Clinical Laboratory of the University Hospital.
 - Horton C. Hinshaw, PhD: (1928 - 1932) Associate Professor of Parasitology.
 - Harald Krischner, MD: (1928 - 1931): Adjunct Professor of Pathology and Laboratory Director.

2. Creation of Department of Bacteriology, Hygiene and Parasitology and Department of Pathology 1929
 - Dikran Berberian, MD: (1930 - 1933) Assistant Professor of Bacteriology and Parasitology; (1933 - 1947) Associate Professor of Bacteriology and Parasitology.
 - E. Westervelt Dennis, PhD: (1931 - 1941) Associate Professor of Bacteriology - Parasitology and Chairman.
 - Harutune Senekjian, MD: (1934 - 1937) Instructor in Bacteriology.
 - Hans Karl Gustav Homma, MD: (1933 - 1935) Adjunct Professor of Pathology; (1936 - 1937) Professor of Pathology, Chairman.
 - Edmund Mayer, MD: (1937 - 1941) Visiting Associate Professor of Pathology, Chairman.
 - Edith Sproul, MD: (1946 - 1949) Professor of Pathology; (1946 - 1948) Acting Chair; (1956) Visiting Professor of Pathology, Columbia University, New York.
3. Hospital Laboratory set up as separate department of Laboratory Studies 1949.
 - Krikor S. Krikorian, MD: (1949 - 1957) Director of Hospital Laboratories.
 - Raif E. Nassif, MD: (1951) Instructor; (1954) Assistant Professor; (1958) Associate Professor; (1952 - 1994) Professor of Clinical Pathology (Laboratory Medicine); (1958 - 1966) Director of Hospital Laboratories and Chairman of the Department of Clinical Pathology; (1966 - 1994) Professor.
4. Change of name of Department of Laboratory Studies to Department of Clinical Pathology 1955
Pathology Department (separate)
 - Philip Sahyoun, MD
 - Frederic Roulet, MD: (1950 - 1951) Visiting Professor of Pathology and Acting Chair.
 - Edmond Shwayri, MD: (1950 - 1952) Assistant Professor of Pathology.
 - Nimr Tuqan, MD: (1952) Instructor of Pathology; (1953) Assistant Professor; (1959) Associate Professor of Pathology.
 - Henry Azar, MD: (1958 - 1960) Assistant Professor of Pathology; (July 1965 - December 1966, and May 8 - 19, 1978) Visiting Professor from University of South Florida College of Medicine, Tampa, Florida.
 - Harry Sproat, MD: (1959 - 1962) Visiting Associate Professor of Pathology.
 - Latifeh Ghandour, MD: (1961) Assistant Professor; (1969 - 1976) Associate Professor of Pathology; (1975 - 1976) Acting chair.
 - William Shelley, MD: (February 11 - May 11, 1965) Visiting Professor of Pathology from Johns Hopkins University, Baltimore, Maryland.
 - Fred Stewart, MD: (February 1965) Visiting Professor of Pathology from New York Memorial Hospital, New York.

- Said Zu'bi, MD: (1966 - 1967) Instructor in Pathology.
- Amin T. Nasr, MD: (1968 - 1970) Instructor in Pathology.
- Jean Rebeiz, MD: (1968) Instructor of Internal Medicine (Neurology) and Pathology (Neuropathology); (1969) Assistant Professor; (1974) Associate Professor; (1980 to date) Professor; (1976 - 1985) Acting Chair of Pathology; (1985 - 1995) Chair.
- Charles Allam, MD: (1968) Instructor of Clinical Pathology; (1970) Assistant Professor; (1980) Associate Professor of Pathology and Laboratory Medicine; (1987 - 1988) Professor.
- Wedad Riad, MD: (1969 - 1975) Visiting Assistant Professor of Pathology.
- Janine Tomb, MD: (1969 - 1978) Assistant Professor of Pathology (Cytopathology).
- Harald Noltenius, MD: (1970 - 1973) Professor of Pathology, Chairman.
- Ramez Azoury, MD: (1964) Instructor of Obstetrics and Gynecology; (1965) Assistant Professor; (1971) Associate Professor; (1980 - 1983) Professor.
- Victor H. Nassar, MD: (1970 - 1975) Assistant Professor of Pathology; (1973 - 1975) Acting Chair.
- Fawzi Abu Jamra, MD: (1967 - 1968) Instructor of Pathology (part time).
- Zuheir Naib, MD: (June 15 - August 28, 1974) Visiting Professor of Pathology (Cytopathology) from Emory University, Atlanta, Georgia.
- Michael Gravanis, MD: (October 15 - December 15, 1974) Visiting Professor of Pathology from Emory University, Atlanta, Georgia.
- William Christopherson, MD: (February 1 - April 30, 1975) Visiting Professor of Pathology from University of Louisville, Kentucky.
- Abdur Rahman Sa'di, MD: (July 28 - September 11, 1976) Visiting Assistant Professor of Pathology.
- Joel Brunson, MD: (September 1, 1977 - March 31, 1978) Visiting Professor of Pathology from the University of Mississippi Medical Center, Jackson, Mississippi.
- Walter Sheldon, MD: (March 1 - June 30, 1977) Visiting Professor of Pathology from Johns Hopkins University, Baltimore, Maryland.

Clinical Pathology Department (separate)

- Robert Matossian, MD: (1954 - 1956) Acting director of the Blood Bank.
- George Abu-Haidar, MS: (1959 - 1975) Hospital Biochemist, Lecturer in Clinical Pathology.
- Samih Alami, PhD, MD: (1961 - 1963) Assistant Professor of Clinical Pathology, part time; (1968) Assistant Professor; (1972) Associate Professor; (1977) Professor of Laboratory Medicine; (1968 - 1996) Chairman and Director of Hospital Laboratories.
- Alejandro Chediak, MD: (1962 - 1963) Lecturer in Clinical Pathology and Deputy Director of Hospital Laboratories.

- Farid Khouri, MD: (1954) Assistant Instructor; (1961) Instructor; (1966) Assistant Professor; (1966 - 1968) Acting Chair; (1980 - 1996) Professor.
- Harry Smith, PhD: (1964 - 1965) Visiting Research Associate, Department of Clinical Pathology.
- Leila Rafie, MD: (1964 - 1968) Instructor in Clinical Pathology.
- Nabil Wakid, PhD: (1972 - 1989) Clinical Chemist, Associate Professor of Laboratory Medicine.
- Tanios Koussa, MLT: (1976 - 1977) Instructor in Laboratory Medicine.
- M. Zuheir Habbal, PhD: (1975) Assistant Professor of Clinical Pathology; (1984) Associate Professor; (1992 to date) Professor.
- Ziad Salem, MD: (1981 - 1993) Assistant Professor of Laboratory Medicine (part time).
- Raif Nassif, MD
- Leila Zahed, PhD (1992) Assistant Professor of Laboratory Medicine; (1998 - 2008) Associate Professor.
- George Araj, PhD: (1992 - 1995) Associate Professor of Laboratory Medicine; (1995 to date) Professor.

5. Change name of Clinical Pathology to Laboratory Medicine, 1978
Pathology Department (separate)

- Jean-Pierre de Chadarevian, MD: (1979 - 1980) Associate Professor of Pathology; (1979) Acting Chair.
- George Bannayan, MD: (September 16 - October 31, 1979, and February 1 - May 31, 1980) Visiting Professor of Pathology from University of Texas at San Antonio, Texas.
- Amira Mansour, MD: (1978) Assistant Professor of Pathology; (1987 - 1990) Associate Professor.
- Patrice Hassoun, MD: (1981 - 1984) Assistant Professor of Pathology.
- Ghazi Zaatari, MD: (1981 - 1984) Assistant Professor of Pathology and Laboratory Medicine.
- Amjad Mufarrij, MD: (1981) Assistant Professor of Pathology; (1986) Associate Professor; (1996 - 2000) Professor.
- Fadi Abdul Karim, MD: (1984) (2010 - 2012) Visiting Professor of Pathology.
- Siham Fuleifil, MD: (1985 - 1988) Assistant Professor of Pathology.
- Hanna Kaspar, MD: (1987 - 1989) Instructor; (1993) Assistant Professor of Gynecological Pathology; (2001 - 2008) Associate Professor.
- Jean Rebeiz, MD: (1968) Instructor of Internal Medicine (Neurology) and Pathology (Neuropathology); (1969) Assistant Professor; (1974) Associate Professor; (1980) Professor; (1976 - 1985) Acting Chair of Pathology; (1985 - 1995) Chair.

- Ayman Tawil, MD: (1991) Assistant Professor of Pathology; (1999) Associate Professor; (2010 to date) Professor.
 - Nina Salem Shabb, MD: (1991) Assistant Professor of Pathology; (1997) Associate Professor; (2008 to date) Professor.
 - George Araj, PhD: (1992 - 1995) Associate Professor of Laboratory Medicine; (1995 to date) Professor.
6. Pathology and Laboratory Medicine combined into one department of Pathology and Laboratory Medicine 1996, composed as follows:
- Samih Alami, PhD, MD^A
 - George Araj, PhD
 - M. Zuheir Habbal, PhD
 - Hanna, Kaspar, MD
 - Amjad Mufarrij, MD^B
 - Raif Nassif, MD, MPH (emeritus)^C
 - Jean Rebeiz, MD
 - Ayman Tawil, MD
 - Nina Salem Shabb, MD
 - Rose Daher, PhD: (1995) Instructor; (1996) Assistant Professor of Laboratory Medicine; (2003) Associate Professor; (2014 to date) Professor.
 - Joud Haidar, MD: (1996 - 2004) Assistant Professor.
 - Elizabeth Kfoury Baz, MD: (1997) Instructor; (2000) Assistant Professor; (2007 to date) Associate Professor.
 - Mireille Kattar, MD: (2001 - 2008) Assistant Professor of Pathology
 - Rami Mahfouz, MD: (2002) Assistant Professor; (2008) Associate Professor; (2015 to date) Professor.
 - Mamdouha Ahdab-Barmada, MD: (2006 to date) Adjunct Associate Professor.
 - Nawaf Jurdi, MD: (2006 to date) Clinical Instructor of Pathology.
 - Fouad Boulos, MD: (2007) Assistant Professor of Pathology; (2014 to date) Associate Professor.
 - Chantal Farra, MD: (2007) Assistant Professor; (2014 to date) Associate Professor.
 - Zaher Chakhachiro, MD: (2009 - 2010; 2012) Instructor of Pathology; (2013 to date) Assistant Professor.
 - Ibrahim Khalifeh, MD: (2009) Assistant Professor of Pathology; (2014 to date) Associate Professor.
 - Khalil Charafeddine, MD: (2012 to date) Assistant Professor of Pathology.
 - Ghazi Zaatari, MD: (1995) Associate Professor and Chair; (1996 to date) Professor and Chair.

^A Deceased in 1999

^B Deceased in 2000

^C Deceased in 2013

- Leila Zahed, PhD (until 2008)
- Samer Nassif, MD: (2013) Instructor of Pathology; (2015 to date) Assistant Professor.
- Riyad El - Khoury: (2014 to date) Assistant Professor.

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**CORNELIUS VAN ALEN
VAN DYCK
1818 - 1895**



Cornelius Van Dyck, founding professor
of pathology and medicine at the Syrian
Protestant College

CORNELIUS VAN ALLEN VAN DYCK

History of Life:

Cornelius Van Allen Van Dyck was born on August 13, 1818, in Kinderhook, New York state. He was the son of Dr. Henry and Catherine Van Dyck, the descendants of Dutch immigrants who settled in that state ^[1,2]. His father was a county practitioner who supplemented his professional income by farming land inherited from his ancestors. Cornelius received his primary education at the village school and later attended the Kinderhook Academy where he learned Latin, Greek and mathematics. A friend taught him some botany and assisted him in collecting and studying the wild plants of his vicinity. He never attended College but was influenced by his father towards medicine and through that exposure acquired considerable knowledge of practical pharmacy and some elementary chemistry. The father went through a period of financial hardship but thanks to the generosity of family friends, Cornelius carried on with his studies and pursued medical education first in Springfield and then at Jefferson Medical College in Philadelphia and graduated with Doctor of Medicine in 1839 ^[1,2].

In the early nineteenth century, the United States witnessed a strong wave of religious “revival” and “awakening” accompanied by missionary enthusiasm that swept many colleges and seminaries. The young doctor was caught by it and shortly after graduation, he joined the American Board of Commissioners for Foreign Missions and sailed for Syria and arrived in Beirut on April 2, 1840, after a long and tedious voyage ^[1,2,3]. Within a short period, he started learning Arabic which he mastered over the years and ultimately published several scientific and medical books in Arabic ^[1,2,3,4]. His first assignment was in Jerusalem where he spent 8 months before returning to Lebanon. In 1842, he married Ms. Julia Abbott, the daughter of the British consul. His first assignment was in the Shouf mountain where he established a missionary center and founded a school. He was ordained as a priest in 1846 and in that year he was appointed in charge of Abieh School. The second assignment was to Sidon in 1851. In 1854, he visited the US and brought back with him the first microscope to the region. In 1857, he was asked to move to Beirut to finish the work on the translation of the Bible to Arabic after the sudden death of his fellow priest, Eli Smith, who was in charge of that project. For that purpose and in 1860, Dr. Van Dyck visited Vienna, Leipzig, Dresden and Halle to confer with Orientalists on the translation project and share what he has accomplished thus far in the

project. In 1864, he completed the translation of the New Testament from Greek and a year later, he completed the translation of the Old Testament from Hebrew. His second visit to America in 1865 was for the electrotyping the new translation of the Bible. During his stay in New York, he taught Hebrew at the Union Theological Seminary and got interested in ophthalmology due to the close proximity of the Bible House to the New York Eye Infirmary ^[1,2,3].

In 1866, the Syrian Protestant College (SPC) (later named American University of Beirut) was founded in Beirut and Dr. Van Dyck was invited in 1867 to be the chair of Medicine and General Pathology in the newly established Medical Department (i.e. School of Medicine and School of Pharmacy), to which Ophthalmology was provisionally attached to his assignments. He enthusiastically accepted this invitation and in addition he held the duties of Professor of Chemistry, until a replacement could be secured for the latter position. Later and because of his profound affection to Astronomy and Meteorology, he undertook to teach these subjects after he was relieved of Chemistry and was instrumental in building the Observatory on campus and the acquisition of a telescope. Dr. Van Dyck stayed on the faculty of SPC until December 1882 when he resigned from the College in protest of the termination by the Board of Managers of the College of another faculty member Dr. Edwin Lewis, who spoke favorably on Darwin's theory of evolution at the commencement exercises earlier in the year ^[3,5].

Several months after his resignation, Dr. Van Dyck accepted an invitation by the Orthodox Greek Hospital of St. George in Beirut to conduct an outpatient clinic, twice weekly, where he continued to work for several years until his retirement ^[2,3]. Retirement from teaching at SPC allowed him time to publish a series of brief elementary books in Arabic on scientific subjects such as General Introduction to Natural Science (1886); Chemistry (1886); Physics (1886); Physical Geography (1887); Geology (1887); Astronomy (1888); Botany (1888); and Logic (1889) ^[3,4].

Although Dr. Van Dyck resigned his faculty position at SPC in 1882, he retained his membership to the Syrian Protestant Mission until his death in Beirut on November 13, 1895, presumably due to typhoid fever ^[2,3].

Main Achievements to Medicine and Pathology:

In preparation for his appointment as a founding faculty member at SPC where the formal education was in Arabic, Dr. Van Dyck wrote an 800 - page book of pathology and medicine entitled "Basic Principles

of Internal Pathology i.e. Theoretical and Practical Principles of ^[6]. This book served as the basis of medical education in junior years and students used to copy the book until it was finally printed in 1878 and expanded to more than 1000 page book ^[7]. The book was divided into three parts: Part I covered general pathology principles, part II covered classification of diseases, and Part III covered specific medical diseases. In the latter part, there is definition of specific disease entities, their clinical signs and symptoms and where applicable, there is pathology description based on autopsy or tissue examination. Treatment was also covered in this part of the book. In some sections, there is mention of in vivo testing and chemical analysis in diagnosing disease. Interestingly, there is a sizeable section of the book on the microscopic and chemical analysis of urine in several diseases and the section on diseases of the blood includes microscopic descriptions of leukemia cells in peripheral blood ^[7]. There is brief but explicit description in the book to the detection of renal and bladder cancer by microscopic examination of urine. The book includes descriptions of aortic aneurysms and of interest is the reference to the treatment of this condition by coiling; Dr. Van Dyck describes the "introduction of a metallic wire to the aneurysmal sac to generate fibrin deposition followed by the introduction of a trocar to insert a 30 arm length of a very fine ribbon into it" ^[8].

In 1874, Dr. Van Dyck published another medical textbook in Arabic entitled "Principles of Physical Diagnosis" ^[9]. Most descriptions are based on pathological changes that occur in the organs and systems covered in this 128 page book. It includes several illustrations of the pathological conditions of the lung and the tracheobronchial tree. At that time of his death, he was working on a book of General Pathology and another on Ophthalmology but these were never published.

As a medical educator and a key member of the founding faculty of the Medical Department, Dr. Van Dyck was instrumental in setting the foundation for a four year curriculum for medical education at SPC with a prerequisite of preparatory education in science and mathematics prior to the admission of a student to the Medical Department. This was a pioneering effort and progressive thinking for the day and ahead of many leading United States medical colleges which lacked structured curriculum and qualified dedicated faculty. At the time of its founding, SPC did not have a teaching hospital and for that purpose, an agreement was made between the College and Johanniter Hospital (the Prussian Hospital), built by the Knights of the Order of St. John, whereby the clinical teaching would be conducted at that hospital.

Dr. Van Dyck practiced medicine in the outpatient department and he carried on with this practice until his resignation from SPC in 1882. The Prussian Hospital was fairly well equipped, housed more than eighty patients, and was only five minute walk from the new SPC campus in Beirut. It had a laboratory equipped with microscopes, centrifuge, chemical reagents and few other appliances. Autopsies were also performed at the hospital ^[10]. Unfortunately the medical records of that hospital are not available since after World War I, it became a war bounty to the French government and remains so until the present day.

What is intriguing is the source of the medical knowledge of the medical and pathology books of Dr. Van Dyck, which were up to date for their times. The prefaces to his books do not list references to the sources, something not unusual for the publications of that era. Actually the preface to the hand written edition of the first version of his pathology and medical book has a historic perspective on human maladies with reference to Galen, Averroes, and more modern European physicians but there is no explicit reference to specific book sources ^[6]. However, the text in some chapters refers to the work of some of the noted pathologists of the late 19th century such as Rudolf Virchow and Carl von Rokitansky. The contents of the books were generally well outlined with methodical approach in the descriptions of a myriad of medical diseases. This carries great significance considering that the publications are the work of a single author who was simultaneously heavily preoccupied with other missionary assignments and only traveled abroad on three occasions during his lifetime in Lebanon. Even these trips abroad were not medical in their objectives and were primarily related to his mandate of translating the Bible. His interest in microscopy is well documented and he was instrumental in introducing it to the country in 1854 through his acquisition of a single eye pieced microscope which he used in his studies. Knowing his inquisitive scientific mind, it is very possible that he had exposure to medical sciences during his trip to Germany in 1860, where such disciplines, including pathology, were quite advanced in comparison to the rest of the world. His stay in New York between 1865 and 1867 may have provided him with yet another opportunity to advance his knowledge of pathology and medicine although during this period, his medical attention was primarily focused on ophthalmology. However, it is logical to conclude that his published work in pathology is most likely based on translating educational material (books and other publications) that he obtained from Europe and United States and to that, he added his relevant personal clinical experience in the country.

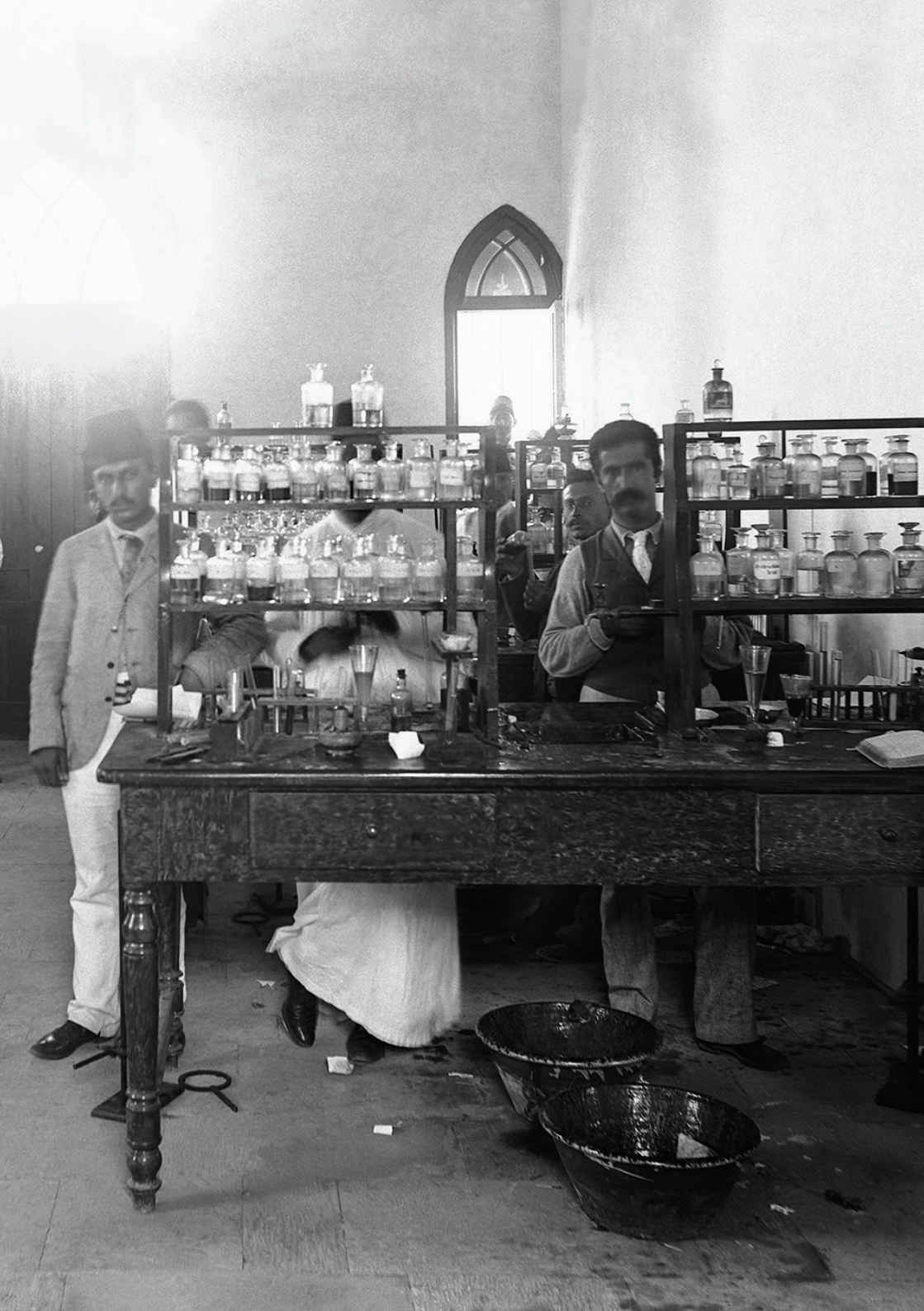
Dr. Cornelius Van Dyck dedication and inspiration during his tenure at SPC in the 19th century had major impact on medical education not only in Lebanon but also in the Levant region for centuries to follow. His emphasis on teaching basic sciences and pathology as essential foundations for clinical medicine was definitely a pioneering concept for the region with lasting imprints until present times.

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Going through the files and archives of the Department of Pathology and Laboratory Medicine was an inspiration to explore its history. This journey over the past 150 years showed how the Department evolved and transformed during this period

of glorious record of the American University of Beirut (AUB) in the Middle East. Learning about the founding faculty of the Syrian Protestant College and those that followed at AUB, as the College came to be known later, revealed the solid framework under which this department has been founded and demonstrated the high ethical values and the strong commitment by them to the University's mission in education, clinical service and research and to the communities they served. This brief history also outlines the active interplay of pathology and laboratory medicine with other medical disciplines, a unique feature of this medical specialty. The timing of publishing this book could not have been better as the University observes its 150th anniversary.

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