The Department of Anatomy in the University of the Philippines College of Medicine: Dissecting the History

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A globally competitive department providing modern and state-of-the art facilities conducive to optimum learning for students, producing multi-disciplinary-based research from a committed and competent faculty, with the able support of a friendly administrative and technical staff (Department of Anatomy Mission/Vision).

The history of the Department of Anatomy of the College of Medicine of the University of the Philippines can be chronicled from its humble beginnings in 1907 to its continued existence through the COVID-19 pandemic. This article briefly describes its historical development, current undertakings, and future directions in relation to its mission and vision.

1907 to 1930s: History Unfolds

The Anatomy Department was one of the basic sciences immediately organized by the first dean of the Philippine Medical School in 1907, Dr. Paul Freer. **Dr. Robert Bennett Bean** (1874-1944), an instructor of Anatomy at the University of Michigan (1905-07), was the pioneer in a roster of notable department chairs (Table 1). The first Filipino chair in 1913 of the newly renamed "College of Medicine and Surgery" of the University of the Philippines, was a returning pensionado (Batch 1904), **Dr. Arturo Del Fierro Garcia**, from the University of Colorado School of Medicine (Class 1909).[1-4]

The newly built Philippine Medical School building, which housed the Anatomy Department in the whole third floor, was opened for class and instruction on July 1, 1910. The Malecón city morgue was later transferred to a new location near the main building. Act No. 1667, stipulated that unclaimed bodies 48 hours after death could be used for the purpose of medical science, thus, fulfilling the anatomical requirements of the new school.[5-7]

In the early years, anatomy (gross anatomy, histology, embryology) was taught in the first and second years, encompassing a total of 1000+ hours, including even Saturdays (Figures 1 and 2). Two students were assigned to one cadaver, with eight to ten students assigned to an instructor.

1940s to 1970s: Rising Above the Ashes

The Japanese Occupation during the Second World War (1942-1945) brought bombings and artillery fire to the University of the Philippines College of Medicine—with the department included—yet, the college distinguished

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Table 1. Roster of Chairs of the UPCM Department of Anatomy

1907-1910*	Dr. Robert Bennett Bean
1910-48*	Dr. Elbert Clarke Dr. R. Lhamon Dr. Edward S. Ruth Dr. Arturo D. Garcia Dr. Juan C. Nañagas *(Acting Head 1931-32)*
1948-52	Dr. Marciano Limson
1952-57	Dr. Fidel Z. Cuajunco, Sr.
1957-61	Dr. Jose V. Encarnacion
1961-64	Dr. Jose N. Dualan
1964-66	Dr. Nathaniel G. Ferrer
1966-67	Dr. Oscar M. Tangco
1967-71	Dr. Vicente S. Versoza, Jr.
1971-72	Dr. Nestor S. Bautista
1972-85	Dr. Mariano V. dela Cruz
1985-88	Dr. Sesan M. Castro
1988-91	Dr. Arcangel F. de Leon
1991-97	Dr. Arlene A. Samaniego
1998-2003	Dr. Noel G. Guison
2004-2012	Dr. Jacob S. Matubis
2013-2022	Dr. Pio Renato F. Villacorta
2022 to present	Dr. Rafael C. Bundoc

Sources: Siyento: Centennial Commemorative Book[3]; Various UP Course and UPCM College Catalogs from 1911 to present.

**Best estimates of duration of chairmanship for Dr. Clarke, Dr. Lhamon, Dr. Ruth, Dr. Garcia. Data extrapolated from University of the Philippines General catalogs circa 1911-1912, 1912-1913, 1913-1914, 1915-1916, 1916-1917, 1917-1918, 1921-1922, 1923-1924, 1932-1933. Missing data from 1914-1915, 1918-1919, 1919-1920, 1920-1921, and 1922-1923.*

itself as the only unit of the university that remained open and functional during the war (Figure 3).[8,9]

During this era, cadaveric dissection was still important because it allowed students to appreciate gross anatomy with all five senses. In accordance with DOH Administrative Order 89-A, s. 1961 and later the Sanitation Code of the Philippines (P.D. 856, s. 1975), the UPCM was authorized to store, process, and utilize cadavers for scientific purposes.

A histochemistry laboratory was constructed in the 1960s, and a department library and conference room were finished by the 1970s. Dr. Tangco authored the Department's Laboratory Manual of Human Histology; this was first published in the year 1967, and subsequent revisions were made in 1968, 1970, 1976, 1985, and 1995. New microscopes were purchased in 1978, and the osteology collection was replenished for students to use as learning aids.[6]

In the post-war (1946-1983) curriculum of the College, the total number of hours allotted to Human Anatomy was further reduced from 1,020 hours to 493 hours.[6] For clinical correlation, dedicated lectures were given by clinicians on topics such as radiologic anatomy, orthopedics, otorhinolaryngology, surgery, dermatology, and rehabilitation medicine.[8,10]

Figure 1. Dissections in the 3rd floor of Calderon Hall circa 1920s.

Source: Archives of the University of the Philippines, Manila. (Photo courtesy of Dr. R. Bundoc, credit to original owner).

Figure 2. Dr. Robert Bennett Bean among medical students during a Histology class circa 1920s.

Source: Bundoc, RC. A Priori Ad Infinitum. Manila: Mu Sigma Phi Fraternity, 2008. p.58.

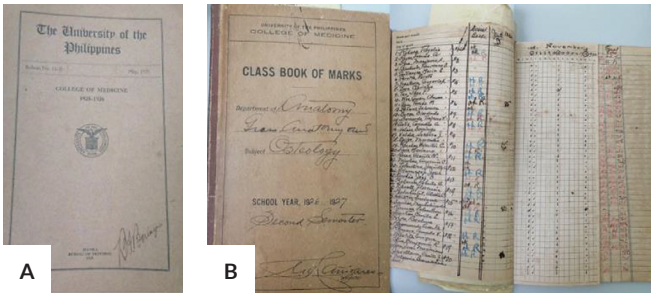

Figure 3. ***Preserved pre-war artifacts in the UPCM Department of Anatomy:*** **(A)** Department copy of the 1925-1926 UPCM College Catalog, **(B)** 1926-1927 Anatomy Class Book of Marks in Gross Anatomy and Histology.

Source: Archives of the UPCM Department of Anatomy. (Photos by R. Genuino)

In 1971, the three courses (gross anatomy, histology, neuroanatomy) under the Department were combined into one subject: Human Biologic Structure (HBS); this change was in line with the College's thrust towards curriculum integration. However, the course was abolished after five years because it did not show any distinct advantage, and the three original courses were restored.[6]

The Department also offered electives and courses for students in dentistry, nursing, physical and occupational therapy, and public health. The dissection facilities were also available for use by surgical residents of the UP-Philippine General Hospital.[8]

1980s to 1990s: Dawn of the Digital Age

As part of the faculty recruitment strategy, faculty were recruited from various clinical departments and a linkage with PGH departments (Dermatology, Medicine, Pediatrics) allowed Anatomy faculty to cross-train for six months of the year. A department musical quartet was also born and twice-weekly painting sessions for the faculty were held during the chairmanship of Dr. Arcangel de Leon – which are useful artistic skills in teaching anatomy.[11] A Gross Anatomy Dissection Manual, evolved in the 1980s from a dissection guide initiated by Dr. Sesan Castro in 1972, to which other department faculty enriched with clinical correlations. Electron micrographs taken by Dr. Arlene Samaniego during her fellowship in Japan in the late 1980s were included in the textbook of histology of Dr. Jose N. Esteban (together with Dr. Eduardo Gonzales), which was first published in 1985 and is now on its 6th edition.

Computerization of the Department took off with the purchase of the very first desktop PC (the 8086 XT) during Dr. Castro's term (late 1980s). Other novel techniques and equipment in cadaver preservation and immunostaining, and digital photomicrography were also acquired. Further modernization by installation of desktop computers and monitors, and a local intranet to synchronize educational resources was also implemented.

A more efficient examination system was introduced during the chairmanship of Dr. Noel Guison in the late 1990s; this included machine-readable Scantron test forms, multiple-choice options, and item analysis. The first major renovation of the Department since World War 2 was undertaken in the early 2000s, with modernization of the histology and dissection laboratories (renamed Dualan Laboratory). Computerization grew in leaps and bounds – to multi-user workstations complete with LAN connections, scanners, digital camera, video camera, photocopiers, CD writers, and data-grade LCD projectors. Large-scale production of histologic specimen slides was a project that benefited other medical and paramedical schools (such as UP-School of Health Sciences Leyte) with whom slides were shared.

With the 7-year Integrated Liberal Arts and Medicine (INTARMED) program in place in 1982, the teaching of neuroanatomy became absorbed in a 3-part integrated course, Neurosciences, consisting of 240 hours, which was participated in by nine departments, including Anatomy. This course began in year level 3 and continued until clinical clerkship.[12] The student to cadaver ratio was reduced from 4:1 (1980s) to 6:1 to 7:1 (1990s) as the 1st year medical student population increased.

In December 12-13, 1998, the UPCM and NTTC (headed by Dr. Corazon Gonzales), together with the Philippine Society of Anatomists, organized a Competency-Based Learning Workshop for all anatomy departments of Philippine medical schools. The goal of the workshop was to update and improve or even completely change the prepared competencies.[13] A Master of Basic Medical Sciences was launched in 1999, a joint multidisciplinary offering by the Anatomy Department and three other departments, namely: Biochemistry and Molecular Biology, Pharmacology, and Physiology.[14] It is currently being revised to be more attuned to the present trends.

2000s to 2020s: Blazing the Trail: Organ System Integration (OSI) to the COVID-19 Pandemic

Several pioneering innovations made their way into the Department: a plastination laboratory (2000s), body freezers, and a cadaver lift in 2018 under the chairmanship of Dr. Jacob Matubis and Dr. Pio Renato Villacorta. The college shifted to the Organ System Integration (OSI) format in the mid-2000s, where basic and clinical lectures were combined based on organ systems.[15]

March 15, 2020, marked the beginning of one of the strictest lockdowns in the world as the COVID-19 pandemic hit home[16] and purely online classes were implemented. New and different learning tools and software aids were utilized, such as CANVAS (https://www.instructure.com/canvas) and PANOPTO (https://www.panopto.com/). With the development of the vaccine, and as the world opened up again, the Department of Anatomy launched the Learning Enhancement in Anatomy Program (LEAP) in July 2021 (Figure 4). The pioneering bridging program aimed to reinforce the students' knowledge and understanding of gross and correlative anatomy. Prosected cadavers and specimens, bones, and anatomical models were used in conjunction with virtual dissection tables, virtual reality headsets, and clinical skill stations. The succeeding year's LEAP 2 (July 2022) showcased additional innovative teaching approaches, including a hands-on procedure station involving Thiel-embalmed cadavers with modified model devices where students learned how to perform basic thoracentesis, and histology stations with individual light microscopes per student and curated histologic slides accompanied by a laboratory guide.[17,18]

Figure 4. Anatomy Learning Enhancement in Anatomy Program (LEAP 2021) in the University of the Philippines College of Medicine: **(A)** First year medical students exploring prosected cadavers, **(B)** First year medical students learning from digital anatomy software, **(C)** Faculty guiding a student in identifying important neuroanatomical structures, and **(D)** Faculty and resident physician (from the Philippine General Hospital) demonstrating laryngoscopy on a soft Thiel cadaver.

(Photos by J. Barroa)

Figure 5. Faculty and staff of the Department as of 2022, led by Dr. Rafael Bundoc, chair *(center, seated)*.

Source: UPCM Department of Anatomy Archives.

Other technological improvements in the Department included Virtual 3D Anatomy Dissection Tables (Anatomage), plastinated specimens, and a digital slide scanner (Aperio LV1 — Real-time Digital Pathology System).

Future Directions

Grounded in its mission and vision under the leadership of its current chair, Dr. Rafael Bundoc, the Department is gearing to expand and improve its facilities and equipment, pioneering intellectual property projects, and pursuing research excellence (Figure 5).

According to Dr. Bundoc, the improvements in the Department should involve not only the living but also the dead. We give tribute to these irreplaceable silent mentors, who offered themselves in service for the learning of future physicians. Facility improvement projects down the line include the Surgical Center for Anatomical Learning and Pathological Educational Laboratories (S.C.A.L.P.E.L), a joint project with the UPCM Department of Pathology

aiming to upgrade the mortuary and construct a state-of-the-art learning venue for teaching and procedure simulation. Another project is the Learning Innovations for Knowledge in Health Applications (L.I.K.H.A.), which is an upgraded and formal wet simulation laboratory.

Dr. Bundoc started an initiative to pursue potential intellectual property projects in anatomical education to expand the knowledge of the Department members and strengthen its partnership with the UP Technology Transfer and Business Development Office (TTBDO). To further this endeavor, a seminar on intellectual property was also conducted by the UP TTBDO on November 18, 2022, to expand the knowledge of the Department members and strengthen its partnership with the UP TTDBO. The first documented intellectual property application of the Department is the DISSECT table (Dissection In Situ Submersible Ergonomic Cadaver Table), an upgraded and modified dissection table, filed on December 29, 2022. At the time of this writing, several intellectual property projects are currently in the works, including cadaver preservation, devices, and technology-based learning aids.

Collaborations with students and external linkages are also being pursued to enhance the research output of the Department. To augment the resources for projects, continuous utilization of the Department research unit fund will also be encouraged. The established research workshops and annual departmental research forum with professorial lectures will be regularly conducted with the intention of continuous faculty improvement. To formalize the prioritization of these projects, the organizational chart was revised with the appointment of a vice-chair for external linkages and vice-chair for research.

Rising from the latest challenge of transitioning from online learning during the COVID-19 pandemic to hybrid programs, the Department is poised to continue its gains in modernizing its facilities, developing innovative instructional materials, and conducting relevant educational research. As the Department carries on with the legacy of those who came before, we envision to put the UPCM Anatomy Department on the map as a Center of Excellence in Anatomy and Histology education, wet simulation, and training.

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