

CHAPTER II

Rebirth: 1925-1931

Glen Cullen was appointed Professor and Chairman of Biological Chemistry in 1924 and oversaw Biochemistry's role in this major transition of the School of Medicine. Cullen received his B.S. in chemical engineering at the University of Michigan. Later he accepted a position in D.D. Van Slyke's laboratory at Rockefeller Institute, eventually receiving his Ph.D. for their collaborative work. He left Rockefeller to become the John Herr Musser Professor of Experimental Medicine at the University of Pennsylvania. It was from there that he was attracted to Vanderbilt. It seems likely, though it is not certain, that his Rockefeller connection led to his recommendation to Dean Canby Robinson and Chancellor Kirkland. A special personal insight into this period is possible through some unpublished notes (see Appendix for the complete text, *Shavings*) of Charles Summers Robinson, Cullen's eventual successor.

“By the time Vanderbilt Medical School was reorganized, biochemistry had become a recognized member of the chemistry family. The first Professor of Biochemistry was Glen Cullen. He came to Vanderbilt in 1924. Dr. Cullen was one of those intense, dynamic individuals who was actively interested in everything with which he came in contact. Although his professional interest was in biochemistry, his membership in the faculty of a medical school stimulated a keen interest in the broad subject of medical education in all its aspects. He worked enthusiastically for the improvement and expansion of the School as a whole. Probably his most

important single achievement was his insistence that the faculty of a medical school be allowed to accept graduate students whose work in the Medical School would receive credit in the Graduate School of the University. This not only benefited the Medical School but it gave an added impetus to graduate work in the University which at that time was just beginning to assume importance. He was personally responsible for the introduction of graduate work in the medical sciences. When Dr. Cullen came to Vanderbilt, interest in the application of physical chemistry to biochemical processes was at its peak. His mathematical training had given him easy access to this field and it was emphasized in the course he gave to the medical students. Great stress was placed on hydrogen ion concentration, buffers, acid-base balance, etc., the importance of which was just coming to be appreciated.”

Dr. Cullen's own view of his new Department situated in the brand new building, now Medical Center North, was given in an article he prepared for *Methods and Problems of Medical Education (Thirteenth Series, 1929)*, a series sponsored by the Rockefeller Foundation. Part is excerpted here.

“The Department of Biochemistry occupies the first floor of one of the east wings of the Medical School, and, in addition, shares a lecture room with the Departments of Physiology and Pharmacology. Eight single unit and three double-unit rooms lie on the two sides of the corridor which opens into the large (six-unit) student laboratory which provides for 52 students. The refrigeration room is unusually large and provides space with free access for storing solutions, tissue, rubber tubing, etc. The constant temperature room adjoining the cold room is the most valuable asset of the department. This room has a false ceiling containing heating and cooling coils and is equipped with a quiet ventilating system. Any ordinary temperature, usually 20 degrees or 25 degrees C. can be maintained indefinitely to within 0.5 degree. The fume hoods in the laboratory are placed in the four corners of the room and are equipped with gas, electricity, water, steam and steam baths.

There is one steam-bath opening for each student. The limitation of the student capacity of this laboratory to 52 was a mistake. A department planned for a 50-person (medical) class should have space for at least 65 students to care for special and graduate students and to provide space for special equipment. The student laboratory should also have some space free from desks for special apparatus. Our experience so far convinces us that the present tendency of American medical schools to shorten the time assigned to biochemistry and physiology is a serious mistake. It is a curious paradox that at a time when medical research is utilizing biochemical and physiological methods more than ever before in the history of medicine, medical schools should be reducing the time available for presenting these subjects to medical students.

The first third of the (medical) course is devoted to *The Application of Chemical Principles to Physiological Processes*. It comprises a discussion of solution chemistry including the colligative properties of solutions, colloid chemistry, and the distinction between the intensity and quantity factors of energy. The laboratory work includes the calibration of apparatus, standardization of solutions, colloidal phenomena and an intensive drill in the use of indicators and buffer solutions. The study of foodstuffs and of metabolism is mainly quantitative. The methods used in the laboratory are the standard methods used in the food laboratories or in the clinic. The last third of the course is devoted to the class work in the study of blood and urine with reference to abnormal as well as normal conditions.”

Despite the dated aspects of some details, it is easy to see within these paragraphs many practical and philosophical problems concerning the role of biochemistry in medical education, which recur “in every generation even unto the present day.”

The role of physical chemistry in the Department was further strengthened by the appointment of J.M. Johlin as Associate Professor. Johlin subsequently authored a text on

physical biochemistry, one of the first in this field. Indeed, special emphasis on the teaching of physical chemical aspects of medical biochemistry continued in the Department until the late 1980s.

Course hours for Biochemistry grew from 209 to 300 during this period but sometimes fluctuated as emphasis within the curriculum varied and as new fields were introduced. A typical list of courses included:

Course 21: Chemistry of Solutions and Foods—4 lectures and 9 laboratory hours during the first trimester of the first year

Course 22: Physiological Chemistry—3 lectures and 9 laboratory hours during the second trimester of the first year

Course 23: Advanced Work in Biochemical Methods

Course 24: Research Work in Biochemistry

Course 25: Advanced Work in Colloid Chemistry

Course 26: Advanced Pathological Chemistry (elective for 3rd and 4th year students)

Course 27: Seminar in Biochemical Literature

It is of interest that the Department of Biochemistry pioneered the offering of elective courses to the medical students as early as 1926. This innovation came to be an important aspect of Vanderbilt medical education in later years. In 1935, Courses 21 and 22 were combined and then separated as a lecture course, “Biochemistry” and an accompanying course “Laboratory Work in Biochemistry”. These two courses, with occasional number changes and seismic changes in content, satisfied the core medical curriculum requirement for biochemistry for 56 years, until 1991, when the requirement for the laboratory course was dropped.

Cullen’s key role in initiating the graduate program in the basic sciences at Vanderbilt has been noted. The first recorded

graduate of the Vanderbilt Biochemistry program was Imogene Felts Rose-Earle who received her M.S. in 1927 and her Ph.D. in 1929 working under Cullen. Her doctoral thesis was on the normal variation in pH and carbon dioxide content of blood sera.



Charles S. Robinson, Chair of the Department of Biochemistry,
1931-1949