

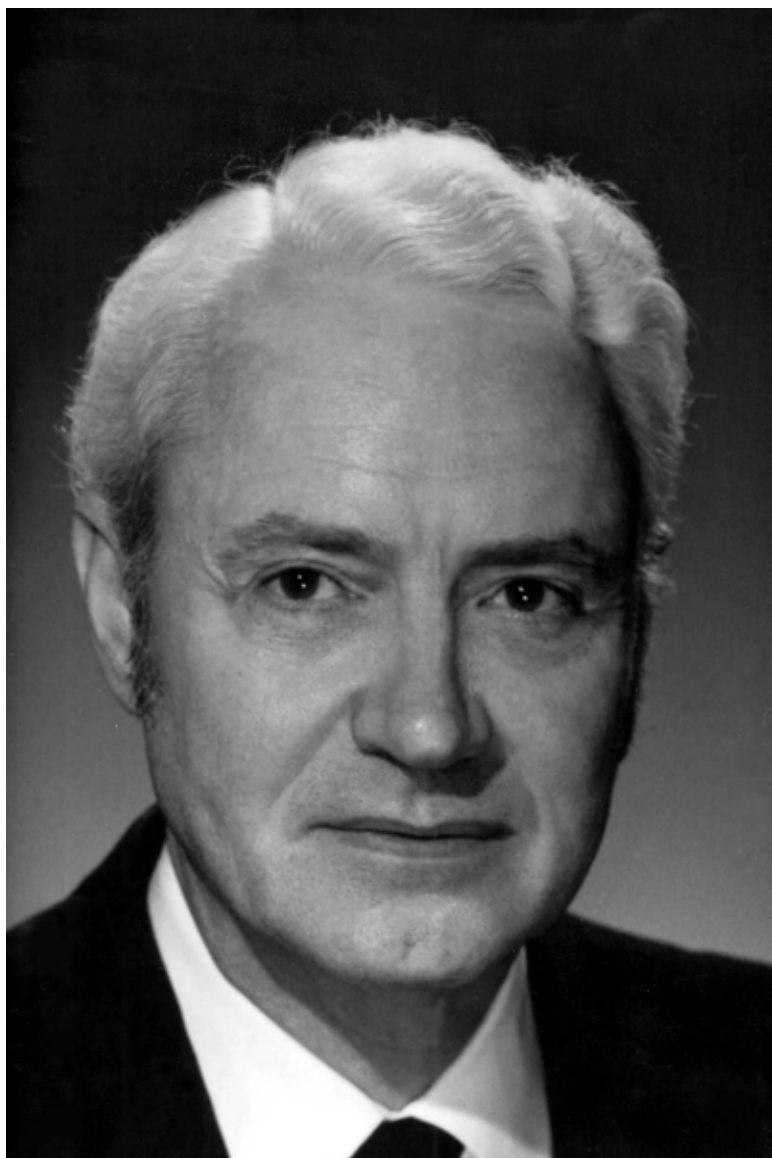
# CHAPTER IV

## Darby and Post War Renewal: 1949-1953

Robinson stepped down as Chairman of Biochemistry effective October 1, 1949 and was succeeded by William Darby. According to several individuals who were at Vanderbilt at the time, Robinson's belief in Bill Darby's potential and his understanding that Darby would succeed him motivated Robinson's decision to leave the Chair somewhat early. He became Professor Emeritus in 1952.

### William J. Darby

Bill Darby was born in Galloway, Arkansas in 1913. He aggressively pursued a combined career in medicine and science from his earliest years and was fortunate to find as a mentor Paul Day, Professor and Chairman of Physiological Chemistry at the Medical School of the University of Arkansas. Day not only gave Darby an early opportunity to do research in his active group but also instilled in him an interest in the history of medicine that was to become a major fascination throughout his life. At Arkansas Darby received his B.S. in 1936 and his M.D. in 1937! In 1942, he received the Ph.D. under H.B. Lewis at the University of Michigan. Darby came to Nashville and Vanderbilt later in 1942 as a Special Fellow in Nutrition of the Rockefeller Foundation in the Department of Medicine, working with John Youmans. Like Paul Day, Youmans was interested in human nutrition, and this experience further strengthened Darby's interest and expertise in the field of clinical nutrition.



William J. Darby, Chair of the Department of Biochemistry,  
1949-1972

During this period, he made contacts at Vanderbilt with Hugh Morgan, Edgar Jones and especially Rudolph Kampmeier, which grew in importance over the years. After a brief period in Chapel Hill, North Carolina where he held appointments at both Duke and North Carolina, he returned to Vanderbilt in 1944 as Assistant Professor of Biochemistry and Medicine. In 1948 he was appointed Professor of Biochemistry and Director of the Division of Nutrition; in 1949 he succeeded C.S. Robinson as Chairman of the Department of Biochemistry. During his years at Vanderbilt, Darby continued and greatly expanded his interest in the field of clinical nutrition. His early interest in folate in Day's laboratory continued throughout his career. In addition, he focused on human requirements and absorption of several vitamins and other micronutrients in collaboration with many colleagues. A special interest in nutrition of pregnant women and infants led to a major early study in Nashville of the assessment of nutritional status. It seems likely that this was the first such study in the United States. It certainly stimulated similar studies elsewhere, which led eventually to the widely used "Recommended Daily Allowances of Vitamins and other Micronutrients." His interest in human iron deficiency led to pioneering studies of iron absorption in children and pregnant women. These studies involved in some cases the use of radioactive iron which, judged retrospectively under the standards of later years, became controversial. In the early 1950s Darby established a Vanderbilt University Nutrition Research Group at the United States Naval Medical Research Unit #3 (NAMRU-3) in Cairo, Egypt. This event led to the development of a decades-long program of nutrition surveys of many developing countries which, in turn, led to important demonstrations of dietary deficiencies. The widespread prevalence of zinc deficiency was of special importance. These studies also fed Darby's interest in the history of nutrition and opened up the areas of ancient and modern Egypt to that interest. Together with Louis Grivetti and Paul Ghalioungui he wrote *Food: the Gift of Osiris* a monograph on the foods of ancient Egypt. This experience further whetted Darby's

long time interest in history and led him into serious “bibliophilia”. Over the years he made an extensive collection of important books and manuscripts in the field of medicine and nutrition, many of which he subsequently gave to the History of Medicine collection of the Vanderbilt Medical Library.

Darby’s interest and experience in the assessment of the nutritional status of populations led to a long relationship with the Interdepartmental Committee on Nutrition for National Defense Development. The goal of this program was to evaluate nutritional status in developing countries and try to define ways to relieve identified problems of malnutrition. Darby personally directed surveys in Lebanon, Jordan, Nigeria, Ethiopia, Ecuador, and the Philippines. Other Biochemistry faculty, especially William Pearson, and many graduate students participated in these studies which provided eye opening, career-stimulating experiences.

Darby had a school-wide, indeed university-wide vision of quality and growth, and worked hard and effectively at all levels through the University Senate and various committees. He worked cooperatively within the School of Medicine and the University to develop and fund new educational and research programs. One of his most important contributions was to chair the Curriculum Committee of the Medical School during a period of major change. One of the results of this study was a revitalization and major extension of the elective curriculum. Darby received the Thomas Jefferson Award of the university in 1969 in recognition of his broad and effective service to the University. He received many other honors for his research and service, most significantly election to the National Academy of Sciences.

The years following Darby’s appointment to the Chair were marked by growth in faculty size and diversity, most particularly in, but not limited to, the fields of nutrition and toxicology. His expertise and professional standing in these areas brought funding for research and faculty expansion to the Department in the difficult financial period of the late 1940s and early 1950s. He employed these resources skillfully to begin the development of nationally recognized programs.

## State of the Department, 1953

In 1948 Touster was made Assistant Professor while in 1949-51, Johlin retired and Anderson moved to the University of North Carolina at Chapel Hill. Frank R. Blood was appointed Associate Professor. A number of course changes and additions were introduced. Course 530, Bioorganic Chemistry, and Course 531 Fundamentals of Biochemistry, the latter aimed at undergraduate students in the biological sciences and taught as a joint offering with Chemistry, were introduced by Touster.

In 1951-52 Ann Minot was made Professor of Biochemistry. Norman Olsen and Walter S. McNutt were appointed as Assistant Professors, and Dorothy J. Buchanan, Robert Tucker, Kenneth Itschner, and William S. Pearson were added as Instructors. Robinson became Professor Emeritus on July 1, 1952.

In his annual report to Dean Youmans, Darby defined the teaching responsibilities of the Department: (1) instruction of medical students, (2) instruction of graduate students in Biochemistry and in other Departments of the University and (3) (for the first time) instruction of postdoctoral fellows. The general areas of education and research in the Department are suggested by the course offerings:

- Course 421: Medical Biochemistry
- Course 422: Laboratory Work in Biochemistry
- Course 429: Clinical Biochemistry
- Course 523: Advanced Work in Biochemical Methods
- Course 526: Bioorganic Chemistry
- Course 527: Seminar in Biochemistry
- Course 528: Fundamentals of Nutrition
- Course 530: Advanced Pathological Chemistry
- Course 531: Fundamentals of Biochemistry
- Course 532: Methods of Analysis of Vitamins
- Course 550: Research Work in Biochemistry

In 1952-53 Blood became Professor, and John Coniglio was

appointed Assistant Professor. Emily Bell and Janet Stone were added as Instructors. Thus, at the beginning of 1953, the fulltime faculty of the Department consisted of William J. Darby, Professor & Chair, Frank Blood, Oscar Touster, John Coniglio, Walter S. McNutt, Emily Bell, William Pearson, Ann Minot, Dorothy Jean Buchanan, and Kenneth F. Itschner. The part-time faculty included Norman S. Olsen, Guilford G. Rudolph, Doris H. Clouet, Janet L. Stone and Robert G. Tucker. Emeritus faculty included C.S. Robinson (former Chairman) and J.M. Johlin. This accelerating increase in the number of faculty suggests that a complete listing for future years will detract from any consistent narrative. Beyond this 1952 listing, only faculty associated with specific events in the narrative and those with particularly long associations with the Department will be especially noted in the text. A list of faculty who have held primary appointments in Biochemistry, taken from School of Medicine records for the various years, is included in the Appendix. A list of graduate degrees awarded through August 2003 is also included in the Appendix.

## Facilities

The physical location and general plan of the Department in 1953 was very much the same as it had been in 1925 as described by Glenn Cullen in his article in "Methods and Problems in Medical Education" mentioned earlier. Some expansion into Department of Medicine space had been possible to accommodate the Division of Nutrition, but the major development then under way was the Graduate Science Annex, the A.B. Learned Laboratory, at the north side of the original Medical School Building. This structure, initially three floors and several years later expanded to 9 floors, was a joint project of Medical and College departments via the Graduate School, and was funded by a gift from A.B. Learned and grants from the United States Public Health Service and, later, the National Science Foundation. This development of new laboratory space for the research programs of the faculty in the several participating

departments, including Biochemistry, was the first since 1925. There followed over the years a variety of space and program developments, still under way in the 21<sup>st</sup> century, which have permitted the rise of the Department of Biochemistry to national and international attention in research.

This first step in the early 1950s was evidence that a new commitment to basic biomedical research had been made by the School of Medicine and by the chairmen of the basic science departments. It is impossible to overstate the credit due to these chairmen, especially Bill Darby, Allan Bass in Pharmacology and Charles R. Park in Physiology, for this and other actions that truly lit the fuse for Vanderbilt's rise as an institution to national research prominence. The faculty committee initially responsible for Learned Lab included Darby, Howard Curtis from Physiology and representatives of the Departments of Chemistry and Physics in the College of Arts and Science. Deans Youmans (Medicine), Beach (Graduate) and Shahan (College of Arts and Science) were also involved in developing and supporting this truly seminal project. The first three floors of this structure were occupied in 1955. It had stood empty for two years after completion of construction, because funds for equipping it were not immediately available. The remaining 6 floors were constructed in 1959 with funds from the Surgeon General matched by Vanderbilt. This entire building serves to the present day as a most valuable area for research. In 2002 it was partly incorporated into a major new building project, MRB-III, for the development of several programs including Neurobiology and Structural Biology, again a joint venture between Medicine and the College. The departments occupying Learned Lab changed frequently over the years as other construction occurred and as program needs changed. This sharing of the space among Graduate School departments in the School of Medicine, the College of Arts and Science, and the College of Engineering has proven "culturally" defining. Sometimes it has been superficially divisive as conflicting needs for space were resolved, but it has surely contributed to the overriding pattern of interdepartmental

and cross-faculty cooperation characteristic of Vanderbilt biomedical sciences. This degree of cooperation, rather atypical and often noted by visitors, was essential for the successful development of Biochemistry in such a relatively small school in a region away from the major “power centers” and before the days of jet travel and the internet.

## Faculty

### John Coniglio

John Coniglio joined the faculty as an Instructor in 1951 after earning his Ph.D. in the Department under Robinson. With his strong background and interest in the burgeoning field of the application of radioactive tracers in medical research, he initiated some of the earliest studies at Vanderbilt with radioactive tracers and began a very influential course, “Use of Radioactive Tracers in Metabolism.” Coniglio’s undergraduate training was at Furman University in South Carolina. He came to Vanderbilt in 1948 to work as a graduate student under Robinson. During World War II, he had served in the Atomic Energy Commission facility at Oak Ridge, Tennessee. It was there, in the mud and wartime semi-chaos of the atomic bomb project, that he gained his interest and background in the use of isotopes in biological research that were to prove so useful to him and to the Department. Coniglio was also a superb and highly motivated teacher, attributes that led to his long-continuing role as the leader and organizer of the course in biochemistry for the medical students. This commitment to medical education led to related assignments including the design of teaching laboratories when the Rudolph Light Building became available in 1974. His energy and experience served the Medical School and the University well and were recognized by the University’s Thomas Jefferson Award in 1978. The Department of Biochemistry later established a prize in his name for outstanding performance of medical students. His own field of research was in



lipid metabolism where he achieved international recognition. He was especially active in early studies of the difficult problem of fractionation of lipid mixtures. He employed the then “high tech,” but large and cumbersome, counter current distribution apparatus developed by Lyman Craig at Rockefeller University. The sensitivity of this procedure to temperature demanded its operation in the only air-conditioned laboratory then available in the early 1950s, sharing it with our other “high tech” instrument, a Beckman DU ultraviolet-visible spectrometer. Later he carried out important studies of lipid metabolism based on fractionation using the then new technique of gas chromatography. Following the resignation of Darby as Chairman in 1972, Coniglio served as Acting Chairman of the Department while the search for a successor to Darby went forward. His death in 2001 cut short a planned collaboration on this “history,” and it sorely misses John’s special insights from his long affiliation with the Department and his particular interest in medical education.

### **Oscar Touster**

Touster joined the Department in 1947 after receiving the Ph.D. at the University of Illinois in that year under Herbert Carter, a leading early “bio-organic” chemist. Touster was at Abbott Labs during World War II, part of that time with the penicillin project. His interest in carbohydrate metabolism led to innovative studies at Vanderbilt of pentose metabolic pathways. For this work he was awarded the Theobald Smith Award of the American Association for the Advancement of Science in 1956. He developed an undergraduate course in Biochemistry, the first at Vanderbilt, in cooperation with the Department of Chemistry. He also developed a graduate level course in bio-organic chemistry that was popular and instrumental in bringing those new developments in biochemistry into the Vanderbilt program. In 1957 Touster, with the assistance of a Guggenheim Award, undertook what was apparently the Department’s first formal “sabbatical” year. Much

of his time was spent at Oxford in association with the laboratory of Hans Krebs. Touster was a leading investigator throughout his years at Vanderbilt. He trained many excellent graduate students and postdoctoral fellows who went on to make important contributions to biochemistry in other institutions. His unique value to the University was recognized in 1964 when the Chancellor, Alexander Heard, appointed him to be Chair of the newly created Department of Molecular Biology in the College of Arts and Science. His presence there assured both the quality of that new venture by the University and a continuation and expansion of inter departmental cooperation in the area of biological science. His contributions were recognized both by his designation as Harvey Branscomb Distinguished Professor and with the Thomas Jefferson Award.

### **Frank Blood**

Frank Blood received his Ph.D. in biochemistry from the University of Michigan in 1940. After several years in industry in the area of industrial toxicology, he joined the faculty of the University of Denver. In 1950, he accepted his old friend Bill Darby's invitation to join the Biochemistry faculty at Vanderbilt. Blood's main teaching interests were the physiology of small mammals and industrial toxicology. His course in physiology was extremely useful for graduate students who frequently came into biochemistry from chemistry with little or no knowledge of anatomy and physiology. Blood's major contributions to the Department and the School were probably made in the areas of "infrastructure" and program development. Tragically, Blood died suddenly in 1971. Perhaps Darby gave the best summary of his many roles in a letter shortly after Frank's death:

"In the days of the worst financial difficulties in the early 1950s, Frank Blood guided the efficient use of the extraordinarily limited resources which we had to begin the physical modernization of the Department of Biochemistry. This included such onerous chores

as scraping together funds to take over and renovate vacated laboratories and the detailed and frustrating planning which went into the evolution of the A.B. Learned Graduate Science Hall. Blood also had the primary responsibility for the scientific planning and design of the centralized animal quarters in the Light Surgical Research Laboratory. He made himself an expert on air conditioning, caging, and humidity. He deliberately took on several rather routine government contracts with the aim that they would finance the cages and equipment for general use in that facility. This was the beginning of proper centralized animal care at Vanderbilt. Later Blood took on the development of an animal care farm, which made possible the maintenance of larger animals for experimental purposes. Over the years he turned his attention to the onsite Apparatus Shop and the Department of Medical Illustration and brought these services up to a standard which made them broadly useful to all medical school faculty. Perhaps most impressive was Blood's acceptance of the responsibility of Director of the Clinical Hospital Laboratories at a time when they were in sad need of renovation and were showing a financial loss."

The clinical laboratories had been the responsibility of Ann Minot for many years but were being caught up in the same sea change that was coming to biomedical research, to the practice of medicine, and to the operation of a modern hospital. Minot was then Professor of Biochemistry, and the School looked to the Department to "modernize" the hospital laboratories. It is difficult in the year 2003 to picture the state of affairs in the clinical laboratories in these years. Tests were dispersed, carried out in individual clinical departments both to insure quality and as a source of income. The main centralized component was Clinical Chemistry. Blood immediately began on a shoestring to modernize these laboratories, especially Clinical Chemistry. Rapidly, he brought these units to a high level of usefulness for the clinical faculty and, in a few years, into profitability for the hospital. Later, responsibility for all the clinical laboratories

was shifted to Pathology in keeping with a national trend. This difficult but successful process at Vanderbilt owed much to this early effort of Frank Blood and his associates, Willard Faulkner and Gil Rudolph.

However, Blood's greatest legacy was the establishment of a research and teaching program in toxicology. Leaning on his wide prestige in this area and working with his usual total effort, he secured the creation of a Division of Toxicology, centered in the Department of Biochemistry but involving several departments in the Medical School and College. He obtained grant support from the United States Public Health Service for both research and training and obtained recognition for this new Division as one of only six university-based toxicology centers in the United States. Since the beginning, this program in toxicology has continued to grow under a series of superb leaders, and as the Center in Molecular Toxicology, is today perhaps the leading Center in the United States.

### **William Pearson**

Bill Pearson received his Ph.D. in Biology at Vanderbilt in 1953 under Ilda McVeigh. He joined the Department of Biochemistry as a postdoctoral fellow working with Bill Darby and in 1954 he was appointed Assistant Professor. He quickly became Darby's strong right arm in the biochemistry section of the Division of Nutrition. He undertook a major role in the international series of nutrition surveys organized by Darby, overseeing the Vanderbilt component in surveys ranging from Ecuador to Spain. His laboratory research interests centered around the metabolism of thiamin and selenium, reflecting a continuing interest in trace nutrients in the human diet.

Pearson was an extremely effective scientist and "ambassador" for nutrition. His knowledge, his pleasant demeanor and his fund of jokes made him welcome everywhere. The Department was shaken by his untimely death in an automobile accident on Thanksgiving Day, 1968. In recognition of his role in the Department and in

appreciation by his many friends, the William Pearson Scholarship was established for award to foreign students or citizens of the U.S. who work in nutrition in the international area. Graduate students, postdoctoral fellows or medical students are eligible.

### **Ann Minot**

Although Ann Minot had first come to Vanderbilt in 1926, she became a member of the Department of Biochemistry in 1945 as Associate Professor and Director of the Clinical Laboratories. In her early years at Vanderbilt, she had been an active member of the Departments of Pharmacology and later of Pediatrics. She was involved in research on hookworm and ascorbic acid deficiency in children and in the development of clinical laboratories. She helped establish and operate the first blood bank at Vanderbilt. As the role of clinical biochemistry in medicine grew, she led that development at Vanderbilt; these activities were recognized by her appointment in Biochemistry and as Director of the Clinical Chemistry Laboratory. Her office, laboratories, and responsibilities were quite separated from the rest of the Biochemistry faculty, so that most of us really did not get to know her well. She never appeared in Biochemistry faculty meetings at least after 1953. It was apparent that she was highly respected for her competence by her clinical colleagues, and she ran this laboratory until her retirement in 1961. She was a skillful and greatly appreciated teacher. A more detailed description of her contributions to Vanderbilt may be found in clinical departmental histories, especially Amos Christie's *As I Remember It: A Narrative Story of the Vanderbilt Pediatric Department*.

### **Leon Cunningham**

In 1953, I was at the University of Washington in Seattle working as a postdoctoral fellow with Hans Neurath, one of the founders of modern protein chemistry. I had gone there in 1951 after graduate study in physical and biological chemistry with Carl

Vestling in Roger Adam's Department of Chemistry at the University of Illinois. In April of 1953, I attended the meeting of the American Society of Biological Chemists in Chicago. In those times, the Society met as one of several member societies of the Federation of American Societies for Experimental Biology. It was one of the very few national biological science meetings in the early 1950s and, as such, was a great opportunity to see and hear luminaries in the field as well as for postdoctoral fellows to seek faculty positions. From Oscar Touster, also an Illinois graduate, I had learned a good bit about Vanderbilt at the previous year's meeting in Atlantic City and was looking forward to meeting him again. My work in Seattle on the molecular properties of pancreatic proteolytic enzymes had been reasonably fruitful, and I had several possibilities for a faculty position. I was especially interested in Vanderbilt because of my inclination to return to the South and because of its excellent reputation in that part of the country. Darby and I had a generally positive discussion, but I was unable to visit Nashville before returning to Seattle. When Darby did offer, by letter a few weeks later, a position as Assistant Professor at \$5000 per year, I accepted it, having never visited Vanderbilt or Nashville. I simply could not find the time to make the trip. We were in the midst of welcoming our second child and of winding down our Seattle life. It was also no small operation in those pre-jet days to fly from Seattle to Nashville on short notice. Later that summer when we arrived in Nashville and I had my first look at the Department of Biochemistry, then in the same old facilities of 1925, I was "underwhelmed." Both the University of Illinois and the University of Washington had built entirely new facilities since the end of World War II, and I was spoiled. Still, my instincts and advice had been sound, and Vanderbilt was exactly where we needed to be. Collegiality and freedom for research and professional advancement were manifested early and well.

I was born in Columbus, Georgia on June 9, 1927, just as the Great Depression began. After education in the excellent public schools of Columbus, I entered Auburn University in the summer

of 1943 on the “fast track,” then popular because of World War II. I received my B.S. in Chemistry at Auburn University in 1947, my time there being split by a year and a half in the Navy. I arrived at the University of Illinois for graduate study in physical chemistry later in 1947. Although I believed then, and now, that physical chemistry is the bedrock of all chemical science, I found the more theoretical aspects too far removed from the laboratory; and in any case, I had developed an interest in biochemistry. During the course of completion of a Masters Program in physical chemistry, I came to know Carl Vestling, a young professor in the Division of Biochemistry who was interested in the relatively new field of “enzymology,” chiefly in enzyme kinetics. He first made me calibrate a set of Warburg flasks and manometers (tedious exercises involving mercury and endless weighing) as a sort of test, I suppose, of my interest and patience. This device, widely used but pitifully primitive by current standards, was designed to assay activity of enzymes in tissue extracts by measurement, typically, of uptake of oxygen. Vestling, however, finally yielded to my pleas and encouraged me to undertake studies of the equilibria and physical effects of the interaction of zinc with insulin. These studies introduced me to the new ideas and instrumentation of macromolecular structure and function. While at Illinois, to supplement the GI Bill, I also worked as a Teaching Assistant in physical chemistry (a course specifically for pre-medical students!) and as a Research Assistant in Botany. In this latter role, while working for James Nance, I had the opportunity to assist an aging icon of biochemistry. Otto Warburg (of the flasks!) was at Illinois collaborating with Robert Emerson in an effort to resolve their disagreement over the quantum yield of photosynthesis. It has always been fun (at least until recent years when his name has come to mean nothing to the present student generation) to mention off hand that I once worked with Otto Warburg before confessing the true nature of my role. After receiving my Ph.D. in 1951, Jean and I, and now Hugh, drove to Seattle where I began work under Neurath on physical chemical properties of the

pancreatic proteases, the archetypal proteolytic enzymes. I was able to prepare and isolate crystalline trypsinogen and the inactive, diisopropyl fluorophosphate inhibited form of trypsin. I was also able to characterize for the first time their molecular properties by ultracentrifugation, diffusion and electrophoresis. We also began a study of the kinetic properties of chymotrypsin and of trypsin acting on a variety of simple synthetic substrates and inhibitors. The most informative inhibitors were the nerve gases, diisopropyl fluorophosphate and its relatives, since both inhibition and reactivation appeared to mimic stages of the catalytic process with true substrates. After two years in Seattle, however, it was time to return to the South and take a “real” job at Vanderbilt.

My first research effort at Vanderbilt was, even then, to seek grant support for a more detailed study of the reaction kinetics of chymotrypsin. Neurath was primarily interested in the proteolytic modifications leading to activation of the proenzymes, trypsinogen and chymotrypsinogen, and had chosen not to press forward on what was to me the most fascinating aspect of enzymes—the actual chemical mechanism of catalysis. He knew I had long been interested in this problem and he encouraged me to take advantage of this opportunity. Indeed, throughout my years at Vanderbilt, Hans Neurath was a steady friend and colleague. He was an active skier, even into his seventies, so much so that his recent death was as unexpected as if he had been much younger. I will always remember his Monday morning greeting of “Vot’s new?” when he had not had a report on my research activities since Saturday noon.

I obtained grant support for this approach to the catalytic mechanism of the proteases from NIH and began kinetic studies. There was no air conditioning in the Department except in “the” instrument room that held the Department’s Beckman DU spectrophotometer and the Craig counter current apparatus, and in the primitive “constant temperature” room of 1925. The tap water used to cool the constant temperature bath in my lab ran at about 30 degrees Celsius during the summer while I needed to run my experiments at 25 degrees. I learned that a previous occupant



of the lab had secretly tapped into the drinking water fountain in the nearby hallway and thus brought cooler water into the fume hood (air draft only) where my experiments were set up. It worked perfectly.

My overall recollection of these beginning years was that, with the absolutely essential help of supportive colleagues, I moved quickly into research and teaching. A quote from a letter I wrote to Neurath about 4 months after I arrived in Nashville gives some insight into beginning a university research career in 1953.

“As you know, I am very happy about the general situation here. Actually there is a great lack of more specialized equipment, but as I was prepared for an even worse situation, it doesn't look too bad. Although I am personally not yet affected, due to the generosity of Dr. Darby, the most annoying aspect here is that essentially all money for research must come through grants. A great deal of time, therefore, is given over to filling out applications and writing progress reports.

As far as research is concerned, I am still waiting on my pH meter. I sorely miss having people around with similar interests to talk with. I am really 100% on my own and I confess that the prospect is a little frightening, though it is exactly what I wanted and must have.”

Bill Darby was indeed most helpful in all ways and blessedly left me on my own in research, a continuing departmental tradition. Once, before I had grant support, I needed a particular centrifuge rotor and Darby simply bought it for me. This generosity I later learned was a bit legally suspect since grant funds for another project were involved; but it has to be said that it was a pattern during those years. The “haves” helped the “have-nots” as we all helped one another develop our research base. University budgets, “hard” funds, were so limited that they were rarely if ever available for research. This latter state of affairs continued throughout the following years with rare but crucial exceptions.

Although I was completely unaware of it, I had arrived at Vanderbilt when the School of Medicine was struggling with a

financial crisis that threatened its future. The 1925 endowment had been designed to support free care in the Hospital for the relatively few patients specifically needed for teaching medical students. It had almost vanished as a result of inflation and increased expenses after World War II. Medical administration was pulling in funds from any place it could, including the School of Medicine endowment, to sustain this basic concept of the institution. The situation had become so serious at one point in 1949 that the then Dean, Ernest Goodpasture, proposed that the Hospital be closed, the teaching of medical students halted and the Medical School converted into a research institute. Goodpasture's stature as Vanderbilt's most outstanding scientist on the national scene made this a very serious consideration. Fortunately, however, the leadership of the University rejected this course. These events are described in interesting detail in Robert Collin's recent biography of Goodpasture. By 1950, the financial situation had eased somewhat through more effective management of the Hospital and the realignment of endowment income. Still the situation continued in such an unstable state that in the early 1950s, under Dean John Youmans, consideration was given to abandoning Nashville and moving the School of Medicine to Chattanooga, using the Baroness Erlanger Hospital as a patient resource. I recall attending a meeting of the Biochemistry faculty, perhaps six of us, in Bill Darby's (cigarette smoke-filled in those days) office where he told us about this scheme. Although I had no real concept of the problems involved in assuring and paying for adequate patient material, I was dismayed at the thought that I might soon be leaving Nashville and Vanderbilt University and moving to a completely unknown environment in Chattanooga. This idea, too, came to nothing for reasons I never knew. The real "rescue" of the School of Medicine by the availability of federal research funds was just beginning. Hospital income from Medicaid and Medicare was in the distant future. And by the mid-1980s, Goodpasture's concept of a high-level Vanderbilt research organization had been accomplished without the necessity of abandoning the hospital or medical education.



(Top) Vanderbilt University School of Medicine and Hospital, 1953. Newly constructed Learned Laboratory may be seen on the right (north) side of the main structure. (Bottom) Vanderbilt University Medical Center, 2003. In this view the 1953 structure is at the far right, partly masked by the facade of the Werthan Wing. (The view shown on the front cover is of the School of Medicine and Hospital in 1953.)

In the teeth of this continuing crisis, my basic assignment at Vanderbilt was outlined by Darby in my appointment letter.

“It is our intention that you will initiate the more extensive development of physical biochemistry in our Department and will assume the leadership for the organization of such a program.”

Heady words for a 26-year-old! In research I undertook to do this by initiating the studies of the catalytic mechanism of chymotrypsin I had been eager to carry on in Seattle. In teaching, I took over the amino acid and protein lectures in the medical biochemistry course. I also initiated a graduate level course in Chemistry of Macromolecules, first informally as a series of lectures for my faculty colleagues and later as a more organized course for graduate students. As Biochemistry 333, this became a standard in the graduate curriculum for most of the biomedical science departments of the School of Medicine and for the Department of Chemistry. The near absence of nucleic acids from my “macromolecular” portfolio reflected the fact that in those years this entire aspect of biochemistry required fewer than 10 pages in the standard biochemistry text. The famous paper of Watson and Crick on the double helix appeared in 1953, the year I arrived at Vanderbilt, so that revolution had barely begun.

## Graduate Program

There were not many graduate students in those days but there were some very good ones. Donald McCormick received his Ph.D. under Touster and went on to an illustrious career in research and administration first at Cornell and later at Emory University. At Emory he served as Chairman of Biochemistry and as Dean for the Basic Sciences in the Medical School. Manford “Bud” Patterson also did his thesis under Touster and returned to the Samuel R. Noble Foundation in Ardmore, Oklahoma as Director of Research and Vice President. He was a guiding force in the development of the Tissue Culture Association, an organization that played an important role in the early years of biochemical studies of pure cell cultures and isolated tissues. Jan van Eys, who came from post-war

Holland to work with Bill Darby, remained after receiving his Ph.D. to become a faculty member in the Department. Later, after receiving his M.D. at the University of Washington, he became a leading pediatric hematologist-oncologist and Chair of the Department of Pediatrics at M.D. Anderson and the University of Texas at Houston. Charles Dodgen received his Ph.D. under Frank Blood, and Robert McCluer received his Ph.D. under Touster. Both went on to careers in research, McCluer eventually becoming Director of the Eunice Kennedy Shriver Center for Mental Retardation. Willard Faulkner received his Ph.D. under Frank Blood, and after an outstanding period at the Cleveland Clinic, where he became nationally known as an authority on laboratory methods, he returned to his important role in clinical chemistry at Vanderbilt.