Chapter 12

The Doctor's Doctor

Looking backwards, I can now perceive how my love for science gradually preponderated over every other taste. During the first two years my old passion for shooting survived in nearly full force, and I shot, myself, all the birds and animals for my collection; but gradually I gave up my guns more and more, and finally altogether, to my servant, as shooting interfered with my work, more especially with making out the geological structure of a country. I discovered, though unconsciously and insensibly, that the pleasure of observing and reasoning was a much higher one than that of skill and sport . . ."

Charles Darwin, in his autobiography.[787]

LOOKING BACK, it is clear that the specialty of pathology in Texas has never progressed without obstacle. Yet, the cumulative results are impressive, particularly given the short tenure of the specialty on Lone Star soil.

Though Spanish and Mexican physicians performed autopsies in the late eighteenth and early nineteenth centuries, the earliest recorded communications regarding elementary anatomic pathology came in the 1830s—in Mexico City advisories on smallpox and in Ashbel Smith's writings on yellow fever. While Virchow lectured on cellular pathology, frontier physicians, having no microscopes, augmented their diagnoses with taste, smell, and gross observations. That is, when they weren't going off to war.

The nineteenth century was nearly over in 1889 when Dr. George Dock (1860–1951), who had studied with Osler at the University of Pennsylvania, joined the faculty of the Texas Medical College in Galveston. Immediately, he had set out, with microscope, to educate Texas physicians on many topics, including malarial parasites, the making of blood film, and examination of fresh and stained specimens. A century later in Galveston, the work of **David H. Walker, MD**, and others in the UTMB department of pathology exemplifies the remarkable expansion of pathology research in Texas institutions. Dr. Walker became professor and chairman of the UTMB department of pathology in 1987, and in 1995 was named to the Carmage and Martha Walls Distinguished Chair in Tropical Diseases. He has developed a PhD program in experimental pathology to educate a cadre of well-qualified students, of whom most are Texans.

He also received a designation to establish the World Health Organization Collaborating Center for Tropical Diseases, an effort that extends beyond the pathology department to others at UTMB. The Center is recognized for its role in the field of emerging new infectious diseases. Dr. Walker states it has done so "by characterizing at UTMB a novel rickettsia from Japan, *Rickettsia japonica*, as the etiology of a newly recognized disease, and the discovery of the etiology of the new infectious disease, human granulocytic ehrlichiosis." In addition, it has achieved the reputation by contributions to the "characterization of another new infectious agent, *Ehrlichia chaffeensis* and of the pathology and pathobiology of the disease, human monocytic ehrlichiosis." Contributions also have been made to the elucidation of the etiologic agents of Israeli spotted fever, Astrakhan spotted fever, a new Australian spotted fever, and cat flea typhus.

Particularly noteworthy, he feels, is the recruitment to the Center of a cadre of successful arboviral and rodent-virus microbe hunters including **Drs. Robert Tesh** and **Robert Shope** from Yale University (featured on the front page of a Sunday *New York Times* and in *Science*.)

"Old Red," the original building where Dr. Allen J. Smith taught his first pathology class at UTMB in 1891 and conducted modest but important research, had seen remarkable scientific advancements.

The same could be said of the state's other great institutions—

most of which had sprung from modest beginnings to attain world-renowned reputations. Although none had started in barns, they had fostered research in "shacks," a Sears warehouse, and a variety of other humble dwellings.

As Dr. John Andujar of Fort Worth once wrote, the ancient history of pathology in Texas indeed is not very ancient—yet the progress during that short era is astounding. When Dr. Andujar arrived in Texas in 1938, he could actually shake hands with those who pioneered the specialty in the state, and in that sense, the history of pathology in Texas *is ancient,* for Texas pathologists do link their history to the world's premier teachers of pathology in Berlin, Würzburg, Vienna, Paris, London, Edinburgh; in Boston, Maryland, Philadelphia, and Chicago. To trace the life of a Texas pathologist is to brush shoulders with Virchow, Osler, Welch, Delafield, Ewing, Hektoen, Cannon, MacCallum, Whipple, Karsner, Mallory, Wells, Arthur Purdy Stout, Wiley Forbus, George Caldwell, Paul Brindley, and other great pathologists of the past. It is to grasp the essence of disease and injury, to understand the true causes of death, to feel the excitement and thrill of understanding what all great scientists must feel in pursuing the unknown, to marvel at the miracles of the human body, to have an investigative, probing mind, and the dedication to seek the truth. From the mentoring of the great teachers of the past came many new great teachers—both in academia and in practice. Thus, the *doctor's doctor* arrived in Texas and eventually fanned out across the plains and forests, mountains and valleys of the state. There was an inherent drive to learn and to teach, and the pathologist soon was called upon by other physicians for personal medical advice, and began aiding or guiding the treating physician in making clinical decisions. Through consultation and timely reports, the pathologist soon began making significant contributions to the quality of daily patient care, often providing more exact diagnoses than those made clinically.

Pathology had become not only the keystone but the catalyst of the scientific practice of medicine and surgery in Texas,[788] immeasurably upgrading medicine and bringing an understanding, as Dr. David Walker of UTMB, says of "what *are* diseases and how they occur" and becoming the foundation for patient care management.

Nonetheless, as in the case of knowledge imparted by a teacher to a student, that contribution—that "seep" into medicine—while great, often remains transparent and difficult to measure. However

taken for granted the contribution may be, the tangible results become more obvious when one looks at the big picture over time, and when one considers closely the pathologist's daily tasks.

Since the late 1930s, Texas pathologists have played significant roles in establishing blood banks and have had major impact on their safety. Since the late 1940s, through daily reading of Pap smears, they have facilitated the significant decrease in cervical cancer. Through the careful differentiation of tumors and variations of malignancies, supported by greater patient awareness and mammography in early detection, they have helped reduce greatly the need for radical surgery. Texas pathologists also have taken the lead in introducing and fostering the use of fine needle aspiration (FNA) for biopsy. Now through the essential prudent reading of the PSA blood test, prostate cancer is being detected at a much earlier stage.

Pathologists in many ways are at the forefront of medicine; by seeing the patterns and trends in disease, they can, in a sense, know the future. When they recall the past, they know how far they've come and what they have contributed to medicine.

Dr. Charles Pelphrey of Austin recalls his training in Dallas during World War II.

"Back when I was a resident, we biopsied big tumors and lots of lymph nodes in the breast." As a resident, he first learned about Pap smears, which demonstrated that pathologists could diagnose cancer from cells. Later, when he moved to Austin to practice, he recalled Dr. John Thomas, an Austin surgeon and president of the Texas Division, American Cancer Society, calling a few pathologists to discuss how to take Pap smears. Travis County Medical Society then "fanned out" to the PTA, schools, downtown service clubs, and other groups to make the public aware of the Pap smear. Dr. Pelphrey spoke about the new process to "every county medical society within reach." As a result, by the mid-1980s, cancer of the cervix was being wiped out.

Dr. Oscar Griffin of Orange is convinced that clinicians make better decisions aided by the correct diagnosis provided by pathologists.

Clinical laboratory interpretation sometimes yields very unusual reports, he says, recalling a case in which a patient came in for hernia repair, but he defined a congenital hematologic condition. Then there is cancer.

"There is no diagnosis made of cancer except under the micro-

scope," he adds. "I've seen too many cases thought to be cancer—which were not." Pathologic diagnosis is "very very important."

Progress also can be seen in the reverse. Dr. Billy Bob Trotter of Abilene recalls a young doctor in recent years sending him a skin biopsy to evaluate. Dr. Trotter identified a measles macule. The disease rarely had been seen since vaccines were introduced. The young doctor had thought he was seeing a strange rash.

Hospital laboratory development in Texas also has seen remarkable advancement, and Dr. George J. Race was involved firsthand in the development of a modern hospital laboratory. The work of pathologists in hospitals, he believes, has had the effect of upgrading everything in the hospital—sterility, organization, laboratory, cleanliness.

His words had a ring of familiarity about them. At the second meeting of the Texas Society of Pathologists in 1921, Dr. Frank Hartman, then of Temple and the first president of the College of American Pathologists, led a discussion on how the laboratory service might aid in the standardization of hospitals. In a series of nine questions at that October 1921 meeting in Galveston, the founders of the Society were prescient about many issues. The clinical pathologist, they conjectured, was a consultant, and, furthermore, better understanding was needed between clinician, surgeon, and clinical pathologist regarding their interdependence.

The contribution of Texas pathologists to science

"THE SEPARATION OF ART from science goes back at least to Aristotle, and is implicit in Plato, writes Lester King. "Aristotle made clear the distinction between knowing what to do—practical skill, which represents art; and knowing why you do it—the knowledge that represents science. Practice—that which is actually done—finds its explanation and justification in science."[789]

A 1995 survey revealed an impressive sampling of scientific contributions by Texas pathologists. One survey respondent commented that Texas pathology and Texas medicine in general perhaps "has been more characterized by illustrious practitioners, administrators, and teachers rather than scientists."

Indeed, there has been great contribution to teaching and leadership in pathology by Texas pathologists, and lauded by those responding to the survey were Dr. George T. Caldwell, who had been

chairman of both the department of pathology at Baylor University College of Medicine when it was located in Dallas and then later Southwestern Medical School in Dallas; Dr. Paul Brindley, chairman of the department of pathology and professor at the University of Texas Medical Branch at Galveston; Dr. Vernie Stembridge, Ashbel Smith emeritus professor and former chairman of the department of pathology at The University of Texas Southwestern Medical School at Dallas (and for his leadership in the American Society of Clinical Pathologists, the College of American Pathologists and the American Board of Pathology); Dr. John Childers, professor of pathology at UTMB, Southwestern, and St. Paul Hospital, Dallas; Dr. Frank Townsend as director of Armed Forces Institute of Pathology and chairman of the department of pathology at The University of Texas Medical School at San Antonio; Dr. Malcolm McGavran, head of anatomic pathology at Baylor College of Medicine, Houston; Dr. Joyce Davis, former associate professor at Baylor College of Medicine, Houston, and chair of the department of pathology at Texas A&M College of Medicine, College Station; Dr. Robert Fechner, anatomic pathologist formerly at Baylor College of Medicine, Houston; Dr. Harlan J. Spjut, anatomic pathologist at Baylor College of Medicine, Houston; Dr. Béla Halpert, chief pathologist at Veterans Administration Medical Center, Houston; Major General Elbert DeCoursey of San Antonio; Dr. Carl Lind and Dr. William T. Hill, Baylor College of Medicine, Houston; Dr. A. O. Severance of San Antonio who directed a free-standing pathology residency for many years; Dr. Jack L. Titus of Methodist Hospital, Houston, and Director, of the Baylor Jesse E. Edwards Registry of Cardiovascular Disease; and Dr. William O. Russell of M. D. Anderson Hospital, Houston.

There is a special tie that binds student and teacher in Texas. With the exception of a few rifts—some exacerbating in the mid-1990s in Houston and Galveston—the "town-gown" syndrome has not been highly visible between pathologists. Perhaps that is partly because teachers often have also been practitioners, and practitioners have remained teachers and consultants to other physicians in their communities. In addition, it is said that the Texas Society of Pathologists has been fortunate because it has been built by both academic and nonacademic pathologists.

One Texas pathologist and a member of the Texas Society of Pathologists, Dr. Caldwell, has served as chairman of two pathology

departments in Texas: Southwestern Medical College of the Southwestern Medical Foundation, Dallas, and Baylor University College of Medicine, Dallas. He is remembered vividly for his insistence on perfection, his acerbic lessons, and his profound ability to present information lucidly and logically.

Dr. Paul Brindley, chairman of the department of pathology at The University of Texas Medical Branch from 1929 to 1954, is remembered by his students as "a most stimulating and fair teacher." Many of them followed in his footsteps and became pathologists and professors of pathology in medical schools.

Local organizations and private laboratories also were applauded for their contributions to medical education: San Antonio Society of Pathologists for its tumor seminars; the Houston Society of Clinical Pathologists for its pathology seminar; Brown & Associates, Franz Leidler and Associates, and Peter Marcuse & Associates, Houston, for their contributions to teaching and pathology in Houston.

Dr. John Andujar of Fort Worth was paid tribute as the prime builder of the Texas Society of Pathologists. Praised were trustees of the American Board of Pathology from Texas: **Drs. Andujar; Vernie A. Stembridge,** Dallas; **Merle W. Delmer,** San Antonio, and **John D. Milam,** Houston, president of the Board in 1995. The role of Texas pathologists in other national societies also was praised. Ten presidents of the American Society of Clinical Pathologists have at one time or another been members of the Texas Society of Pathologists: **Drs. Frank W. Hartman, James H. Black, Kenneth M. Lynch, John L. Goforth, John J. Andujar, William O. Russell, Vernie A. Stembridge, Frank Vellios, Thomas F. Dutcher, and Joseph H. Keffer. Dr. Michael W. Lieberman,** Houston, has been president of the American Society for Investigative Pathology, and **Dr. Kenneth M. Earle,** Clear Lake, president of the International Academy of Pathology.

A number of Texans also have been honored for their contributions with the Ward Burdick Award of the American Society of Clinical Pathologists. Historian Esmond R. Long once stated that the list of recipients of the Award was a "roll call of leading clinical pathologists in America."[790] Winners with Texas links include **Drs. Frank Hartmann, 1944; F. William Sunderman, Sr., 1975; William O. Russell, 1978; Vernie A. Stembridge, 1981; Frank M. Townsend, 1983; Frank Vellios, 1985; E. Eric Muirhead, 1986; Thomas F. Dutcher, 1989; William W. Sheehan, 1995.**

Texas pathologists also have been leaders in military medicine, several having distinguished national military careers, including Drs. Frank M. Townsend and Elbert DeCoursey of San Antonio; Carl Lind of Houston and Kenneth R. Dirks of Texas A&M College of Medicine, College Station.

Spurred only a little more than a century ago by the arrival of that student of William Osler—Dr. George Dock—Texas leaders established the proper milieu and made way for remarkable scientific progress in Texas. The first stages of growth became visible through case reports and articles presented at meetings and published by Texas pathologists nationally and after 1905 in the *Texas State Journal of Medicine*. A number of clinical pathology articles were published during these earlier years, including those by Dr. John T. Moore, 1910 TMA president and a visiting pathologist at St. Mary's Hospital, Galveston, before he became a surgeon. After formation of the Texas Society of Pathologists in 1921, case reports and then tumor seminars were presented regularly at meetings, and in the 1940s, the San Antonio Society of Pathologists initiated its annual tumor seminar, drawing nationally known leaders as moderators.

Covering the span of several decades, Texas medical scientists have contributed remarkably in a variety of areas: **Meyer Bodansky, MD**, professor of pathological chemistry at The University of Texas Medical Branch, Galveston, developed a laboratory test that significantly impacted the field of biochemistry; **Arthur Weinberg, MD**, Dallas, hepatocarcinoma in tyrosinemia, 1976; **Weinberg and Milton Finegold, MD**, Houston, finding that fetal hepatoblastoma had a favorable prognosis and did not require extensive chemotherapy, 1986; **Harlan Spjut, MD**, Baylor College of Medicine, Houston, many contributions to the understanding of bone tumors and gastrointestinal diseases, 1960-1970s; **John D. Milam, MD**, The University of Texas Health Science Center at Houston, development of devices to facilitate pheresis, 1980s, development and refinement of blood banking and transfusion approaches for open heart surgery, 1960s, immunohematology; **Milam**, assisting **Denton Cooley, MD**, and others, first human implantation of cardiac prosthesis for staged replacement of heart, 1969; **E. Eric Muirhead, MD**, formerly of The University of Texas Southwestern Medical School at Dallas, hypertension, blood banking, hematology; **Joseph M. Hill, MD**, The University of Texas Southwestern Medical School and Wadley Blood Bank and Research Center, Dallas, with others

such as **Sol Haberman, PhD,** hematology, cancer, infectious disease; **C. T. Ashworth, MD,** The University of Texas Southwestern Medical School, Dallas, broad areas of interests, work with electron-microscopy, and work that was a prelude to Brown and Goldstein's research in cholesterol; **P. O'B. Montgomery, MD,** The University of Texas Southwestern Medical School in Dallas, contributed considerably to aerospace medicine, cancer, ultraviolet light-induced radiation, NASA studies; **Harvey Rosenberg, MD,** Texas Children's Hospital, Houston, descriptions of the benign behavior of infantile soft tissue tumors, helping to avoid mutilating surgery, 1960s-1970s, pathology of patent ductus arteriosus and other congenital lesions, 1960s; pediatric pathology, 1950-present; **S. Donald Greenberg, MD,** Baylor College of Medicine, Houston, characterization of pneumoconioses, 1960s-1970s; pulmonary diseases and asbestos, 1960s-present; **R. M. O'Neal, MD,** Baylor College of Medicine, Houston, atherosclerosis, 1961-1969.

Also, **L. Maximilian Buja, MD,** and **Jack Titus, MD,** Baylor College of Medicine, Houston, cardiovascular pathology, 1972-present. **Titus,** characterization of cardiac conduction system in congenital heart disease 1970s, cardiac pathology 1960s-1990s; **Buja,** pathological basis for detection and sizing of myocardial infarction with the ^{99m}Tc-PYP radionucleotide imaging technique, insights into the basic mechanisms of myocardial infarction, 1975-1985; **Jim Butler, MD,** Houston, classification of Hodgkin's disease, 1950s; **John Batsakis, MD,** Houston, classification of head and neck and salivary gland tumors; **Michael Lieberman, MD,** tumor oncogenes, 1980-present, molecular pathology; **William O. Russell, MD,** and **M. Ibanez, MD,** and others in department, M.D. Anderson Hospital and Tumor Institute, Houston, neoplasms; detailed study of carcinoma of the thyroid; **Charles T. Ashworth, MD,** and **R. C. Reynolds, MD,** University of Texas Southwestern Medical School, Dallas, contribution to discovery of organism responsible for Whipple's disease, 1950s; **R. C. Reynolds,** broad interests, nucleolar caps; **Vernie A. Stembridge, MD,** UT Southwestern Medical School at Dallas, work resulting from Oak Ridge, Tennessee experience, 1953; completed work that Paul Brindley had started earlier, 1956; seminal work pertaining to aircraft accident investigation and aerospace, 1957, 1958, 1959, 1962, work with carbon black, showing inertness of carbon, 1958, 1960, 1962, work with C. T. Ashworth concerning lipid absorption, 1960; and work with **Morris**

Ziff, MD, and Pedro Stastny, MD, having great significance in graft-versus-host disease (the findings of which have withstood the test of time) 1963, 1964, 1965; toxic effect of a popular anesthetic shown, 1966, early description of unique ovarian tumor during pregnancy, 1966; **Richard Scheuremann,** UT Southwestern Medical School, Dallas, contributions to molecular cancer biology; **Mark Siegelman,** UT Southwestern Medical School, Dallas, contributions to molecular pathology; **Louis Picker,** UT Southwestern Medical School, Dallas, contributions to modern flow cytometry; **Edward S. "Ted" Reynolds, Jr., MD,** chairman of pathology at UTMB, Galveston, greatly enhanced basic research in experimental pathology at UTMB, established group of experimental toxicologists, work on molecular mechanisms involved in the cause-and-effect chain of events that lead to cell injury, used simple halocarbon toxins such as CCl_4 to initiate the process of cell injury, national recognition as authority on the ultrastructural and molecular aspects of injury to liver cell membranes, the relationships between the metabolism and hepatotoxicity of haloalkanes, and the role of free radicals in cell injury, inventor of the electron microscopy lead stain; **Alberto Ayala, MD,** M.D. Anderson, Houston, urinary tract pathology, 1970s-1990s; **Jerome H. Smith, MD,** UTMB Galveston, discovered that leprosy organism could be grown in footpad of nine-banded Texas armadillo, pathology of urinary schistosomiasis, 1969-1973, ultrastructure of schistosoma mansoni tegument, 1965, pathobiology of Sarcocystis falcatala in multiple orders of birds; **Alice Smith, MD,** UT Southwestern Medical School, Dallas, role of diagnostic cytology in cancer detection, living cancer research, cytology, early work with bone marrow and leukemias; **Paul Brindley, MD,** UTMB Galveston chairman of pathology, broad range of pathology topics; **R. H. Rigdon, MD,** UTMB Galveston professor of pathology, broad interests using the White Peking as experimental animal, smoking; **Howard C. Hopps, MD,** UTMB Galveston chairman of pathology, environmental, geographic pathology, author of a textbook; **F. Lamont Jennings, MD,** UTMB Galveston chairman of pathology, electron microscopy, broad interests; **Julian Chen, MD,** UTMB Galveston, cytology; **Franz Leidler, MD,** Houston, and other hospital pathologists, general pathology-case reports; **B. F. Stout, MD,** San Antonio, broad range, usually case reports; **A. O. Severance, MD,** San Antonio, surgical pathology, broad range, usually case reports, slides; **David S. Papermaster, MD,** UT

Medical School at San Antonio, molecular pathology using eye as a model; **Frank Townsend, MD**, chairman of pathology at UT San Antonio, broad interests including aerospace, military, others; **Henry C. McGill, MD**, chairman of pathology at UT San Antonio, atherosclerosis research, 1980s-1990s.

C. B. Phillips, MD, Temple, general pathology, usually tumors and case reports; **Robert F. Peterson, MD**, Temple, and others in his department at Scott and White, general pathology.

Also, **George T. Caldwell, MD**, Dallas, a variety of research, usually cancer related; **George J. Race, MD**, UT Southwestern Medical School at Dallas and Baylor University Medical Center, Dallas, endocrinology and broad interests, whale heart; **Bruce D. Fallis, MD**, UT Southwestern Medical School at Dallas, textbook, teaching; **Joel B. Kirkpatrick, MD**, UT Southwestern Medical School at Dallas and later Baylor College of Medicine, Houston, neuropathology; **John Shadduck**, veterinary pathology, UT Southwestern at Dallas and later dean of Veterinary Medicine at Texas A&M University; **Mary Lipscomb, MD**, UT Southwestern at Dallas, immunology; **Michael Bennett, MD**, immunopathology, with **Vinay Kumar, MD**, UT Southwestern at Dallas, immunopathology, natural killer cells; **Fred G. Silva, MD**, UT Southwestern, broad surgical pathology interests, kidney disease; **Edwin Eigenbrodt, MD**, UT Southwestern at Dallas, liver disease; **Nancy R. Schneider, MD, PhD**, cytogenetics; **Errol Friedberg, MD**, chair, and others in the pathology department at UT Southwestern at Dallas, DNA repair; **Dennis K. Burns, MD**, UT Southwestern, neuropathology, AIDS; **Charles White, MD**, UT Southwestern neuropathology, Alzheimer's; **Jorge Albores-Saavedra, MD**, UT Southwestern, surgical pathology.

Truman C. Terrell, MD, Terrell's Laboratories, Fort Worth, broad interests; **May Owen, MD**, Terrell's Laboratories, Fort Worth, broad interests, talc granuloma discovery; **John J. Andujar, MD**, Fort Worth, public health, originator of plasmacrit test for syphilis; **Dorothy Patras, MD**, Fort Worth, amebic encephalitis, and **George Turner, MD**, El Paso, broad interests, usually cancer such as cervix.

Serendipity also continues to play an important part in science, but rarely does a pathological observation translate into a sudden and dramatic change in another specialty. Such, however, was the

case when **Tony D'Agostino, MD,** Southwestern Medical School, pursued a frequent microscopic finding in myocardial infarction, namely, at the periphery of the necrotic zone, there was a bluish stippling. He found the change caused by minerals deposited in the mitochondria and that the minerals were calcium hydroxyapatite.

When the departments of cell biology and pathology were vying for additional funding for a newly introduced electron microscope in the early 1970s, they took their appeal to Fred Bonte, MD, dean. As the D'Agostino finding was discussed, Dr. Bonte feverishly began taking notes.

On the matter of funding, reports Dr. Vernie Stembridge, "A Solomonesque decision was made. He would award his funds to the department first to provide matching funds."

But Dr. Bonte's prowess in nuclear medicine also was at work. He and his associates quickly devised basic animal experiments utilizing homing of isotopes to the area of the calcium hydroxyapatite deposition and were able to accurately quantify infarct size radiographically.

"With great success," Stembridge adds, "these experiments led to the current common and practical use of isotopes in cardiology, truly a paradigm shift in radiology and patient care."

Many individuals outside the field of pathology have contributed to the advancement of the field including **Joseph Goldstein, MD,** and **Michael Brown, MD,** LDL-receptor defects in atherosclerosis; **Sol Haberman, PhD,**and **L. Ruth Guy, PhD,** in blood banking, **Ellen Vitetta, PhD,** in studies of cellular immunology; **Gregory Buffone,** introduction of PCR into clinical diagnostic setting for viral infections; **Charles A. "Mickey" LeMaistre, MD,** original Surgeon General's report on smoking, and leadership of M. D. Anderson Cancer Center, Houston; **Robert M. Moore, MD,** UTMB Galveston, principles underlying surgery of visceral nerves; **Hardy A. Kemp, MD,** Baylor University College of Medicine, Dallas, relapsing fever; **John R. "Dick" Graybill, MD,** and **Michael Rinaldi, PhD,** The University of Texas Health Science Center in San Antonio, animal model work, reference laboratory, antifungal susceptibility testing program; **Jesse Vernal Irons, ScD,** early studies on improved selective media for cultivation of typhoid and other enteric bacteria, precipitin test for differentiation of principal groups of hemolytic streptococci, rapid test for diagnosis of small-

pox and differentiating it from chicken pox, pioneering work in large-scale production and distribution of smallpox vaccine made from embryonated eggs, identification of first outbreak of Q fever in U.S. and the first-recorded outbreak of turkey ornithosis, found rabies in colonial bats and was among first to suggest airborne transmission mechanism among them.

Numerous national and international textbooks, fascicles, and groundbreaking articles have come from the work of Texas pathologists—the list growing exponentially in the 1990s.

Texas pathologists also have contributed significant articles to international, national, state and local medical journals. From the day of its inception, they contributed consistently to the *Texas State Journal of Medicine* (later *Texas Medicine*) reporting clinical studies and case reports. The annual tumor seminars of the San Antonio Society of Pathologists were published regularly in the journal, and various institutions regularly published clinicopathologic conferences for many years. Among the distinguished editors for a series beginning in the 1960s were Drs. C. T. Ashworth, Bruce Fallis, A. O. Severance, Harlan Spjut, and F. Lamont Jennings.

In more recent years, however, CPCs have not been maintained—perhaps having gone the way of the autopsy and for similar reasons.

Stembridge writes, "We must renew our efforts to educate physicians in the science of disease and guard against limiting their training to technology. There are several levels of opportunity to preserve the science of disease: Pathology. During this last century, medical education has been beset by tremendous change. We as leaders in medicine ('the doctor's doctor') must be actively concerned about the future of medical schools and their graduates in all parameters, particularly at the legislative level. Furthermore, our concerns must be about what the medical student is being taught of medicine in general and of pathology in particular. Unfortunately, today some schools with revised curricula have produced an unfavorable environment for pathology. We must exert our influence to restore pathology to its premier consistent position."[791]

One can only hope that decisionmakers will take the long view.

Perhaps there is guidance within the comments of Horace Freeland Judson, author and professor of science and writing at

Johns Hopkins University, who considers the shape of science to come and discusses the paradoxes of prediction. "The unification of the new beyond—quantum mechanics with the grandest questions of cosmology, the unification of molecular biology with evolutionary theory, and the unification of developmental biology with neurobiology and those with perceptual and cognitive psychology—these three unifications span from the mature science of physics through the younger but explosively progressing science of biology to the infantile science of psychology. In all of these, we may predict with modest confidence that von Neumann's warning about complex systems will hold: the nature of possible explanations will change, which is to say, as well, that *the questions we most want to answer have not yet been posed* . . . Today, no scientist dares be complacent. For one thing, the pace is too fast and is still accelerating. And as new science begets new technology, that in turn makes possible new instruments, new tools for research. For another, the shock of the new proves addictive in science, as in the arts. . . ."[792]

On the brink of the twenty-first century, the future of pathology is clouded by a miasma of socioeconomic forces. What will happen to research, to the freedom to make decisions based on an understanding of science? How will medicine assure quality and value to the patient? What will happen because of lost knowledge historically gained by autopsy—the final diagnosis? What role will Texas pathology play in the lives of patients, in the progress of medicine?

But there also is optimism, most pathologists declaring despite the many challenges they would choose their field all over again.

Their faith is justified. As the state matures, outstanding leadership in broad fields of research is coming from people like Drs. David H. Walker, Galveston, chair of pathology at UTMB; Michael W. Lieberman, Houston, chair of pathology at Baylor; Errol C. Friedberg, Dallas, chair of pathology at Southwestern, and L. Maximilian Buja, Houston, chair of pathology at UT Medical School, Houston. As the field of pathology melds into the twenty-first century, no doubt their leadership and that of others will yield extraordinary answers to "questions not yet posed."

In 1808, Dr. Jayme Gurza, performing an autopsy on a soldier in Spanish Texas, made the obvious diagnosis on cause of death in a crudely-furnished room in the Alamo. Not long after, Dr. Gurza

was caught up in an early, short-lived Mexican rebellion against the Spanish monarchy, and imprisoned.

Rudolf Virchow himself had experienced his own political perils in Germany for being vocal on social issues, but he went on to greatness.

George Thomas Caldwell felt only dismay when he arrived in Dallas and discovered the barren facilities where he was to teach, yet when a young student later complained about conditions, Dr. Caldwell admonished:

"You could study medicine in a barn if you had the brain for it."

"Knowledge of the real future is denied to us," Wagar writes, "But we must never lose sight of the one thing we can know about the future: that it will happen, piece by piece, hour by hour, in a relentless procession of causes and effects. No act is without consequences, and no consequences are without further consequences, unscrolling in the forward flow of time."[793]

Dr. Thomas H. McConnell of Dallas, in saying goodbye to his friend and mentor, Dr. Charles T. Ashworth, quoted the Welsh poet Dylan Thomas. His words seem appropriate advice to Texas pathologists as they move from an illustrious history into an unpredictable—yet no doubt even more exhilarating future:[794]

> Do not go gentle into that good night . . .
> Rage, rage against the dying of the light . . .[795]