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Part III: Clinical Departments and Divisions -- Chapter 13: Division of Infectious Diseases (pages 338-346)

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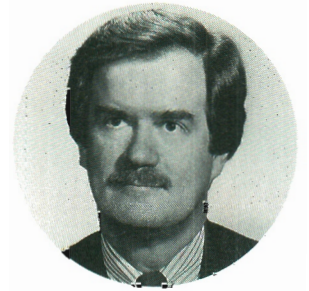
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CHAPTER THIRTEEN



Division of Infectious Diseases

ROBERT I. WISE, PH.D., M.D., D.SC., AND
ERICK J. BERGQUIST, M.D., PH.D.

“What timid man does not avoid contact with the sick, fearing lest he contract a disease so near?” —OVID (43 B.C.–17 A.D.?) *Pontic Epistles III, ii, 13*

FROM earliest recorded history the causes of illness were ascribed to the whims of the gods. Spiritual leaders tried to intercede for appeasement of their anger or to seek their favor by preventive measures to maintain health.¹ The *Holy Bible*, especially in the Books of Leviticus and Deuteronomy, make frequent reference to medical subjects such as sanitation and dietary practice.

Speculation that certain febrile diseases could be transmitted from person to person started many centuries ago. Varro and Columella in the first century B.C. thought that illness was caused by living objects, “animalia minuta,” which were taken into the body by food or air. During the reign of Justinian in the sixth century A.D., bubonic plague was thought to be contagious, and in the fourteenth century enforcement of quarantine in Marseilles and Venice was a practical application of this belief in contagion. Opinion that disease could pass by contact of humans with sick persons was strengthened by the epidemic spread of syphilis in Europe in the late fifteenth and early sixteenth centuries.

In his book published in 1546, Fracastorius

described the transmission of disease by direct contact, by fomites, and through the air. Leeuwenhoek, who owned more than 200 microscopes with more than 400 lenses, was the first to see protozoa under the microscope (1675) and to describe bacterial chains and clumps as well as individual spirilla and bacilli among microorganisms from the teeth (1683). In 1836 Agostino Bassi showed that silkworm disease was due to the presence of microorganisms, thus ascribing a microorganism to a specific disease. In 1843 Dr. Oliver Wendell Holmes claimed that puerperal fever was frequently spread from patient to patient by physicians and nurses, but biologic evidence for his conclusions was not yet available.

Early Interest in Infection at Jefferson

In the theses that the Jefferson medical students were required to write until 1885 as a condition for

graduation, the subjects most commonly chosen were those dealing with contagious illness. Dr. Samuel D. Gross in 1829, in the first year after his graduation from Jefferson, translated, from the German, Hildenbrand's *Contagious Typhus*, a disease confused with typhoid fever (the bacillus of which was not isolated until 1880 by Eberth). Gross' career encompassed the era before bacteriology became identified as a medical discipline around 1880. Lister's *Principle of Antisepsis* (1867) was opposed and required 20 years for acceptance.

At Jefferson, Dr. John K. Mitchell, Professor of Medicine, published in 1849 a small volume of six lectures to the medical students entitled *The Cryptogamous Origin of Malarious and Endemical Fevers*. Among the students was Carlos Finlay (Class of 1855) (Figure 13-1) who in 1881 advanced the theory that yellow fever was transmitted from one individual to another by the bite of a mosquito. Mitchell ascribed the causation of febrile illness to "agents possessed of organic vitality and the power of reproduction which had the power of penetrating into and germinating upon the interior tissues of the human body."

Improved understanding and prevention of hospital-acquired infections was initiated by Ignaz Philipp Semmelweis, the Hungarian physician who in 1846 noted the high mortality rate in puerperal cases in the Allgemeines Krankenhaus in Vienna. The following year he associated the death of his former instructor, Professor Kolletschka, with the cut from a scalpel used in a postmortem dissection. Semmelweis demanded the washing of hands in a chlorinated lime solution as a simple expedient to the conduct of labor. It reduced the mortality rate from 9.92 percent to 1.27 percent.² The work of Holmes and Semmelweis was opposed by the Professor of Obstetrics at Jefferson, Dr. Charles D. Meigs, who attributed this particular malady "to accident or to Providence."

The last half of the nineteenth century witnessed great advances in the understanding of the epidemiology of contagious diseases, associated with methods of prevention by antiseptics and

aseptic methods. Despite this progress, a lack of treatment for suppurative disease persisted for 90 years following the observations of Semmelweis. In the preantibiotic era, lack of therapy for staphylococcal infections resulted in high mortality for those with septicemia (82 percent) or prolonged disability for those who recovered. Although the mortality rates in childhood and youth were lower, the complication of chronic osteomyelitis of the long bones often ensued. Eakins employed this dreaded condition as the theme for his *Gross Clinic*.

Sulfonamides became available in 1937 and suppressed in vitro the growth of staphylococci. They appeared to be of some value in minor staphylococcal infections of the urinary tract, but often failed to eradicate or even control staphylococci. Well-timed surgical drainage of suppurative lesions, especially for osteomyelitis, remained of major importance in recovery.

Infectious diseases were the special interest of Dr. Hobart A. Reimann, Magee Professor of



FIG. 13-1. Carlos J. Finlay, M.D. (1833-1915), Jefferson Class of 1855, who in 1881 ascribed yellow fever to the bite of a mosquito.

Medicine and Head of the Department from 1936 to 1951. He achieved worldwide fame for his many contributions to new knowledge of infections and for the 40 years of his *Annual Reviews of Infectious Diseases* (1935–1975). Dr. Reimann described viral pneumonia in a landmark 1938 article, wrote three books on pneumonia, and contributed to the confirmation of a viral etiology for some nonbacterial diseases.

Establishment of the Division of Infectious Diseases at Jefferson

The first formal resident in internal medicine at Jefferson was Dr. W. Paul Havens, Jr. (Figure 13-2), who received his M.D. degree from Harvard Medical School in 1936 and served his internship at the Lankenau Hospital. From 1938 to 1941 he trained under Dr. Reimann, whose influence led him to concentrate his future career on infectious diseases.

Following his residency at Jefferson, Dr. Havens became a National Research Council Fellow at the Rockefeller Institute (1941–1942). For the next four years, during his service in the U.S. Army



FIG. 13-2. W. Paul Havens, Jr., M.D., Jefferson's first resident in Internal Medicine (1938) and first Director of the Division of Infectious Diseases (1957).

Medical Corps, he investigated the problems encountered by the military with infectious hepatitis. He returned to Jefferson in 1946 as Associate in Medicine and Clinical Microbiology as well as Chief of the Section of Infectious Diseases at the Pennsylvania Hospital. His clinical investigations into the etiology and pathophysiology of infectious hepatitis and his contributions to serologic techniques, particularly complement fixation in the study of neurotropic viral diseases, were internationally respected.

Dr. Havens continued his equal interest in the basic science as well as the clinical aspects of infectious diseases by holding simultaneous faculty appointments in the Departments of Microbiology and Medicine. He was promoted to Associate Professor (1954) and developed the Fellowship Program in Infectious Diseases at Jefferson in 1955. Upon his promotion to Professor in 1957, Havens also was appointed the first Director of the Division of Infectious Diseases.

At retirement on January 1, 1972, Dr. Havens left an impressive list of accomplishments. His lifelong interest in hepatitis extended back to World War II in Egypt and Germany, when he was consultant to the Chief Surgeon, European Command. He was a member of the Neurotropic Virus Disease Commission of the Army Epidemiology Board on Virus and Rickettsial Diseases, the Commission on Viral Infections, the Commission on Liver Diseases of the Armed Forces Epidemiological Board, and a member of the World Health Organization Expert Panel on Viral Hepatitis. He also was editor of *The History of Internal Medicine in World War II* published by the Office of the Surgeon General, Department of the Army. In addition to the Army Commendation ribbon for research in viral hepatitis in 1946, Havens received the Outstanding Civilian Service Award from the Surgeon General of the Army in 1970.

In 1955 Dr. Havens and Dr. John E. Deitrick, Magee Professor of Medicine and Head of the Department, invited Dr. Robert I. Wise to come to Jefferson from the University of Minnesota to assist in the development of a program of

education and research in infectious diseases and the utilization of antibiotics. As Assistant Professor with laboratory space on the eighth floor of the College building, Dr. Wise's research related to the epidemiology of hospital-acquired staphylococcal infections, utilizing bacteriophage typing as a tool, and to the clinical use of antibiotics.

Dr. Wise brought to Jefferson a wide previous experience in the study of infectious disease. His research in microbiology had started in 1937 at the University of Illinois, where he spent a year evaluating chemical and microbiological tests for mastitis in cows (leading to the M.S. degree in 1938). Another year was spent as Assistant in Animal Genetics of the Agriculture Experimental Station to study changes in virulence of a certain strain of *Salmonella pullorum*, and three additional years study in the survival of anaerobic pathogens in home-canned vegetables and meats while working toward a Ph.D. degree (awarded 1942). As Director of the Public Health Laboratories of Wichita Falls and Houston, Texas (1942–1943), Wise performed or supervised the tests for contagious diseases as well as quality control tests for milk and water. For four years as Assistant Professor of Microbiology at the University of Texas Medical Branch at Galveston, his research dealt with *Granuloma inguinale*, in which he demonstrated the cause to be a bacterium. He also studied the problem of sewage pollution of oysters in Galveston Bay. During four years of study for the M.D. degree (1950) at the University of Texas, he collaborated with Dr. Edgar Poth, Professor of Surgery, in developing methods for the reduction of bowel flora. This research led to the use of neomycin in the preparation of the bowel for surgery, which later was used by others in the management of hepatic encephalopathy. Dr. Wise's residency in medicine with a Fellowship in Infectious Diseases was spent at the University of Minnesota with Dr. Wesley Spink. He then served as Assistant Professor of Medicine and Director of the Microbiology Laboratory of the University Hospitals, with special attention to staphylococcal diseases.

With Dr. Havens, Dr. Wise initiated at his arrival in 1955 a weekly infectious diseases conference associated with weekly infectious diseases rounds. These were attended by the Fellows in infectious diseases, by Eileen Randall M.A. (the Hospital microbiologist, who later received a Ph.D. in Microbiology and became a national leader in its technology), by Dr. Gonzalo E. Aponte (later Chairman of Pathology) and by interested medical residents and students.

Dr. Francis J. Sweeney, Jr., (Figure 13-3) joined Dr. Wise in his research in infectious diseases in 1956. Born in Philadelphia in 1925, he obtained his B.A. degree at the University of Virginia (Charlottesville) in 1947 and his M.D. at Jefferson in 1951. He interned at Jefferson (1951–1952), took his residency in internal medicine there (1952–1953, 1955–1957, and spent 1957–1958 as Chief Medical Resident at Jefferson. He spent the years 1944–1945 enlisted in the Navy and 1953–1955 commissioned in the Navy. In 1958 Sweeney was



FIG. 13-3. Francis J. Sweeney, Jr., M.D. (Jefferson, 1951), Researcher and Clinician in Infectious Diseases (1956–1967), Medical Director of Jefferson Hospital (1967–1972), Vice-President for Health Services and Hospital Director (1972–1984).

appointed Instructor in Medicine and continued as a member in the Division of Infectious Diseases until his assumption of the position of Jefferson Hospital Director (1967) with promotion to Vice-President for Health Sciences and Hospital Director in 1972.

Dr. Sweeney, during the late 1950s, performed epidemiological studies of staphylococcal infections with Dr. Wise at the Norristown State Hospital in collaboration with Dr. Robert Mandle of the Department of Microbiology. Dr. Eileen Randall collaborated in similar studies at Jefferson. In 1959 Dr. Sweeney went to Thailand with the Jefferson Medical College/U.S. Public Health Service Cholera Study Team. Between 1957 and 1967 he wrote numerous papers and three chapters in books or reviews on infectious diseases.

Dr. Sweeney was a member of the Professional Advisory Committee of the Department of Public Health of Philadelphia, 1962–1964, and Co-Director of the Victory over Polio Campaign (Philadelphia, 1962–1964). As a consultant in infectious diseases he served at Eagleville Sanatorium (1962–1966), Philadelphia General Hospital (1969–1971) and Chestnut Hill Hospital (1967–1983). Among a host of professional societies, two related to infectious diseases were the Pennsylvania Public Health Association and fellowship in the Infectious Diseases Society of America.

Dr. Sweeney's entry into hospital administration and many board memberships forced him to withdraw from his outstanding career in infectious diseases. He left Jefferson to become Vice-President for the Health Sciences Center of Temple University (1984–1986) and in June 1986 became Vice-President for Professional Affairs and Medical Director of Mercy Catholic Medical Center.

Among Dr. Sweeney's many awards and honors were: the Lindback Foundation Award for Distinguished Teaching (1963), presentation of his portrait to Thomas Jefferson University (1978), Jefferson Annual Alumni Achievement Award (1983), Jefferson's Winged Ox Award (1984), Special Presidential Citation (American College of Physicians, 1985), The Laureate Award Medal (American College of Physicians, 1985), and Mastership, American College of Physicians (1986). He also served as Chairman of the Board of Regents of the American College of Physicians (1983–1985).

A Jefferson "first" occurred in 1955 when a system for daily surveillance of all infections in the

hospital was developed by Dr. Wise. A hospital staff committee including representatives from Nursing Service and all clinical services was organized to study epidemiologic data and make recommendations for prevention and control. In 1956 a nurse, Mary Ann Anderson (Waddell), R.N., who was trained in epidemiology by Dr. Wise, was appointed to conduct surveillance of hospital acquired infections. This was the beginning of the international discipline of Nurse Epidemiologists or Infection Control Practitioners. The program involved daily collection of data from all hospital head nurses and from the Chief of Microbiology, Dr. Eileen Randall, with committee review.

At a 1957 Joint Symposium on Hospital-Acquired Infections in Cleveland, Ohio, Dr. Wise was invited to discuss the Jefferson program. This led to a recommendation to the Board of Trustees of the American Medical Association "that every hospital establish a responsible officer or committee charged with the investigation and control of infections within the hospital and with the institution of procedures and practices designed to prevent such infections."³ This plan was initiated by the Joint Commission on Accreditation of Hospitals in 1958. Visitors from medical centers from the United States and other countries as well as epidemiologists from the Center for Disease Control (CDC), came to Jefferson to learn about the program. This led to the development of a training program at CDC where Terri Camilli (Usitano), R.N., Nurse Epidemiologist at Jefferson, served as consultant and instructor at the first workshop in nurse epidemiology of nosocomial infections.

During the 18 months of March 1963 through September 1964, an epidemic of *Salmonella derby* infection occurred in the Jefferson Medical College Hospital. A total of 155 employees and over 450 patients became infected with this diarrheal disease. Dr. Sweeney and Dr. Eileen Randall developed a program for collection of rectal swabs from every patient being admitted to the hospital and every physician on the staff. Only one physician of approximately 600 tested was found

to be a carrier of *Salmonella* and it was not of the epidemic strain. It was learned that the microorganisms had entered the hospital in chicken eggs. The findings were reported by Drs. Sweeney and Randall at a Conference on Salmonella at the Center for Disease Control and in the *Journal of the American Medical Association*.

When Dr. Wise was appointed Chairman of the Department of Medicine in 1959, it was necessary for him to delegate many of his research activities to Dr. Sweeney, while Dr. Havens continued his Directorship of the Division. There were grants from the National Institutes of Allergy and Infectious Diseases of the U.S. Public Health Service and the Squibb Company. Gow T. Lam, Ph.D., and Charlotte Witmer joined the laboratory staff in 1959 as Research Associates to study abscess-forming factors produced by *Staphylococcus aureus*. Funds for the training of Fellows in Infectious Diseases came from pharmaceutical grants for the investigation of antibiotics. Dr. Craig Wallace was provided a stipend by a grant from the Charles Pfizer Company in 1958–1959. Stipends were provided by Warner-Chilcott for Dr. Joseph F. Rodgers (Jefferson, 1957), and by the Hoffman LaRoche Company for Drs. Thomas G. Bell (Jefferson, 1956) and James R. Regan (Jefferson, 1956). In those early years there was some criticism of receiving funds from the pharmaceutical industry for fear of possible conflict of interest in the reporting of results.

The activities of the Division in evaluation of antibiotics led Dr. Wise to serve on the Editorial Advisory Board of the *Medical Letter on Drugs and Therapeutics*, which required critical review of every publication in the field every two weeks. He was assisted by members of the Department of Medicine and by members of other Departments for 17 years, until his retirement in 1975. The *Medical Letter* became the major force in calling attention to false advertising, in stimulating new legislation, and in bringing to physicians and pharmacists critical unbiased information on drugs in terms of effectiveness, adverse reactions, and possible alternative medications.

Following legislative changes in Congress, a

Drug Efficacy Study was organized to accomplish the Herculean task of reviewing an estimated 4,000 drugs and about 7,000 formulations by members of 30 panels developed by the Drug Research Board of the National Academy of Sciences of the National Research Council. Jefferson cooperated in this endeavor for two years in a review of antibiotics by six members of the staff. Other activities of Dr. Wise, related to Jefferson's clinical investigation of antibiotics, included service as a member of the Committee on Advertising of the American College of Physicians and being invited to testify on drug combinations of antibiotics at the hearings before the Subcommittee on Monopoly of the Select Committee on Small Business of the U.S. Senate, which was investigating competitive problems in the drug industry in 1969.⁴

Dr. Joseph F. Rodgers (Figure 13-4) completed a Residency in internal medicine and a Fellowship in Infectious Diseases, and was Chief Medical Resident in 1961–1962. In 1962 he was appointed Instructor in Medicine and became a full-time

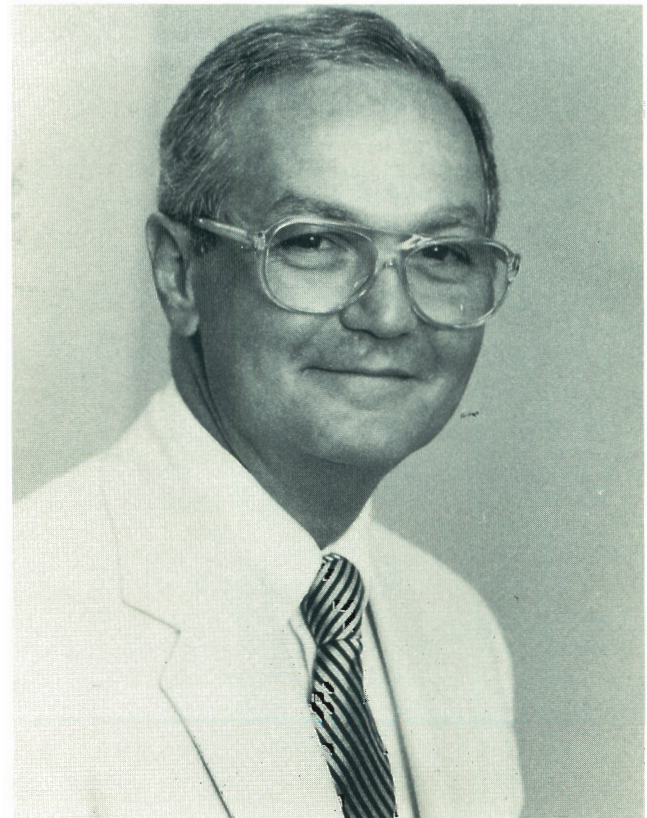


FIG. 13-4. Joseph F. Rodgers, M.D. (Jefferson, 1957), Fellow in Infectious Diseases, Researcher and Clinician in the Division, and Associate Dean, Affiliations and Residency Programs (1984).

member of the Division of Infectious Diseases. He became the Director of the new Division of Home Care, which was established in 1964, and maintained his activities in teaching in the Division of Infectious Diseases. In 1966 he resigned his full-time appointment as Director of the Division of Home Care to become a part-time member of the faculty as Associate in Medicine and continued his active participation in the educational and clinical programs of the Division. In 1984 Rodgers became Associate Dean of the Affiliations and Residency Programs. He currently holds the academic rank of Clinical Associate Professor of Medicine.

Michael Manko, M.D., became a Fellow in Infectious Diseases in 1963–1964, bringing interest and previous research experience during a military assignment with the association of Mycoplasma with primary atypical pneumonia. After completing his Fellowship, Dr. Manko was appointed Instructor in Medicine and developed a program of infectious diseases at the Lankenau Hospital. He continued actively his lectures and attendance at the weekly infectious disease conferences at Jefferson as well as his teaching at Lankenau.

In 1965 the effectiveness of gentamicin and the cephalosporins was examined as therapy for infections caused by gram negative bacteria. Attempts were made to isolate and purify enzymes of *Staphylococcus* and study their role in abscess formation. Dr. Havens was working to adapt the hepatitis viruses to tissue culture.

The Division of Infectious Diseases operated on a very low budget and was dependent on grants from the National Institutes of Health and pharmaceutical companies for studies of therapeutic agents. The programs of medical education were dependent upon the interest and cooperation of the members, who received their financial support from sources other than a Division budget. A boost occurred during the years 1967–1970 with appointments of Drs. Joseph S. Gonnella, Christopher M. Martin, Dominick N. Pasquale, and Earl B. Byrne. Drs. Gary Lattimer and Richard McCloskey were appointed in 1972. Most of these members eventually developed programs in infectious diseases in Jefferson's affiliated hospitals or elsewhere.

Dr. Paul Havens retired as Professor of Medicine, Professor of Microbiology, and Director of the Division of Infectious Diseases in 1972. Budgetary plans were initiated to recruit a full-time Director of the Division, and Dr. Wise

became Acting Director. Unfortunately, the reduction of budgeted funds required Dean Kellow to rule that unfilled positions at Jefferson were frozen in 1973. This was also a year in which Dr. Wise asked to be retired, but Dean Kellow requested that the position of Director of the Division be left vacant to allow the next Head of the Department the opportunity to select the next Director. The heritage left by Dr. Reimann in infectious diseases had been maintained and expanded at Jefferson and its affiliated hospitals. At the retirement of Dr. Wise in October, 1975, Dr. Joseph Gonnella became Acting Director of the Division, but the budgeted position for new leadership in infectious diseases was left to the selection by the next Magee Professor (Dr. Frank D. Gray, Jr.). Dr. Sheila A. Murphey (Figure 13-5) was appointed in November, 1977.

When she was appointed Assistant Professor of Medicine and Director of the Division of Infectious Diseases, Dr. Sheila A. Murphey was Assistant Professor of Medicine at the University of Pennsylvania. Dr. Murphey received her M.D. degree from the Woman's Medical College (now The Medical College of Pennsylvania) and completed a residency in Internal Medicine at Mt. Sinai Hospital, New York, and an Infectious Diseases Fellowship at the Hospital of the University of Pennsylvania under Dr. Richard Root. After completing her fellowship she was an attending physician at the Philadelphia General Hospital until it was closed in 1977. She is board certified in Internal Medicine and Infectious Diseases and has been recertified in Internal Medicine. Her research interests were related to pulmonary macrophages and hospital epidemiology. In addition to her duties as Division Director she is the Hospital Epidemiologist of Thomas Jefferson University Hospital. She has received the Medical Resident teaching award on three occasions.

Dr. Murphey recruited Dr. Erick J. Bergquist (Figure 13-6) to the division in July, 1978. Dr. Bergquist (Jefferson, 1973) received some of his infectious diseases training as a student and Medical Resident at Jefferson from Doctors Paul

Havens, Joseph Rodgers, Joseph Gonnella, Robert I. Wise, and Eileen Randall. He completed an Infectious Diseases Fellowship under Dr. Richard Hornick at the University of Maryland Hospital. Prior to receiving his M.D. degree, he had also received the Ph.D. in parasitology under Dr. Gilbert F. Otto at the College Park campus of the University of Maryland. Bergquist's research at Jefferson has also been related to pulmonary host defenses and antibiotic studies. He is a coauthor with Dr. John R. Dalton, Department of Urology, of a book on urinary tract infection (in press). Dr. Bergquist has received the Medical Resident teaching award and the Alpha Omega Alpha student teaching award. Both Drs. Murphey and



FIG. 13-5. Sheila A. Murphey, M.D., Director of Division of Infectious Diseases (1977-).

Bergquist have secondary appointments in the Department of Microbiology, where Dr. Bergquist has regularly been asked to lecture to classes in the Clinical Masters of Microbiology program. Dr. Bergquist chairs the Antibiotic Utilization Subcommittee of the Pharmacy and Therapeutics Committee and for four years was the Chairman of the Intern Selection Committee of the Department of Medicine.

Dr. Murphey recruited Dr. Hans H. Liu to the Division in July 1985 after he had completed a postdoctoral fellowship under Dr. Alexander Tomaz at the Rockefeller University. Dr. Liu received the M.D. degree from Harvard Medical School, completed a residency in Internal Medicine at The New York Hospital-Cornell Medical Center, and an Infectious Diseases Fellowship at the Yale-New Haven Hospital. He is board certified in Internal Medicine and Infectious Diseases. His current research activities include study of mechanisms of antibiotic action and resistance.

In 1980 the Fellowship program of the Division of Infectious Diseases was reactivated and Richard Wills, M.D., trained for one year from 1980-1981. Paul Alessi, D.O., trained from 1982-1984, Joyce Rubin, M.D., from 1984-1986, and J. Robert Williams, M.D., began his training in 1986.

The Infection Control Program has been significantly expanded in order to fulfill its multiple duties, which include routine surveillance for nosocomial infections, outbreak investigation, management of exposures of patients and of personnel to contagious diseases, teaching infection control theory and practice at all levels throughout the hospital, and infection control policy review in all departments of the hospital. Three Infection Control Practitioners, Ms. Beth

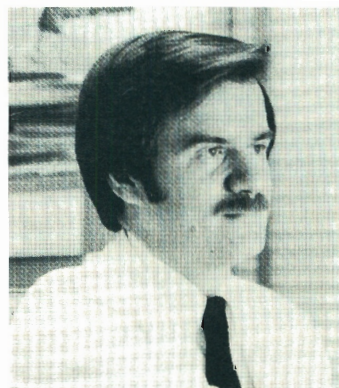


FIG. 13-6. Erick J. Bergquist, M.D. (Jefferson, 1973), Clinician, Teacher and Researcher in the Division of Infectious Diseases.

Ossman, Ms. Joan Forrer, and Mrs. Leigh Gitman now assist the Hospital Epidemiologist.

The third edition of the *Jefferson Infection Control Manual* is now in preparation. Uniform employee health policies emphasizing disease prevention have been developed in cooperation with Dr. Robert Gilbert of the Student and Employee Health Service. Computerization of the Clinical Laboratories has provided easy access to long-term as well as immediate microbiologic data and permitted long-term studies in several areas. Yearly "Infection Control Week" programs and other educational campaigns have publicized to the Hospital such topics as hand washing and needle safety.

Nosocomial infections, their natural history and their prevention, continue to provide a fertile research area for the Division. Dr. Murphey and Dr. Donald Jungkind, Director of the Clinical Microbiology Laboratory, are currently involved in a study of the epidemiology of *Mycobacterium avium-intracellulare* at Jefferson. Dr. Murphey and Dr. Alessi reviewed infectious diarrhea in Jefferson employees, finding *Campylobacter jejuni* to be the most common pathogen isolated. Dr. Murphey and Dr. Rubin studied the epidemiology of *Acinetobacter* isolates at Jefferson. Each of these studies has been reported at national scientific meetings. Currently, Drs. Liu, Williams, and Murphey are studying the epidemiology and significance of *Staphylococcus epidermidis* bacteremia and Drs. Murphey, Liu, and Jungkind are

investigating the frequency and resistance mechanisms of borderline oxacillin-resistant *Staphylococcus aureus*.

Determination of causes along with the control of infectious disease has been a major factor in the prolongation of the human life span. A waging battle continues in the elimination of old diseases and the encounter with new ones. Never in the history of mankind have the resources to win this battle been more propitious. Jefferson will continue its role and contributions in this field.

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