JOHN HOLMES DINGLE

1908—1973

A Biographical Memoir by
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BY WILLIAM S. JORDAN, JR.

John Dingle's contributions to biomedical science and medical education were fully expressed in each of the components of the classic triad of research, teaching, and service. He pioneered studies of the epidemiology and etiology of acute respiratory infections in military and civilian populations, which set a standard for all such future studies; he created a new department of preventive medicine at Western Reserve University (now Case Western Reserve) and participated in the school's extensive review of medical education and subsequent curriculum revision; and he served with distinction on numerous national advisory groups, most notably as director of the Commission on Acute Respiratory Diseases and then as president of its parent body, the Armed Forces Epidemiological Board. With a remarkable group of like-minded contemporaries, John Dingle extended efforts in all of these areas to promote international cooperation in the study and control of infectious diseases.

John Holmes Dingle was born on November 24, 1908, in Cooperstown, North Dakota, where his father was a Methodist minister. He was the only child of his father's second marriage, joining six much older children borne by his father's first wife. His mother was from Honeoye, New
York, from which her family sent a barrel of apples each year to North Dakota. As Dingle reminisced in later years when reflecting on limited financial resources in his youth, it was his assignment to bring up apples from the barrel in the basement with instructions that rotten apples were to be eaten first. An apple without spots was a luxury delayed. His father died when Dingle was eight years old; when he was thirteen, the family moved to Seattle, Washington, to live with one of his older half-brothers.

Dingle's predoctoral education was obtained at the University of Washington—a certificate in pharmacology and a B.S. (summa cum laude) in 1930 and an M.S. in 1931. He then journeyed east for three days by train to the Johns Hopkins University School of Hygiene and Public Health, which had earlier granted him a scholarship, only to learn that his scholarship had vanished with the Depression. The school did wave tuition, but he had to do a number of odd jobs to pay for room and board, losing sixty pounds in the process. Observing this, bacteriologist Pearl Kendrick—who later pioneered development of the pertussis vaccine—helped by periodically inviting Dingle to lunch. Hopkins awarded him a Sc.D. in immunology in 1933. Subsequently, again largely for financial reasons, he worked as an assistant bacteriologist at the Maryland State Department of Health Laboratory and then joined the staff of Upjohn Company as a bacteriologist for two years before entering Harvard Medical School in 1935. There he was supported by a Cabot fellowship from 1936 until his graduation magna cum laude in 1939.

As a mature student with a strong background in bacteriology and immunology, Dingle naturally established a beneficial association with Hans Zinsser and the stars and soon to be stars of his department: Leroy D. Fothergill, John F. Enders, John H. Mueller, and F. Sargent Cheever.
He formed a productive bond with Fothergill during a series of studies (with C. A. Chandler) on the pathogenesis of *Haemophilus influenzae* infection in mice. During the first week of August 1938, at the beginning of his senior year, an epidemic of eastern equine encephalomyelitis (EEE) occurred in New England, principally in Rhode Island and southern Massachusetts. Coincident with the peak of the epidemic, encephalitis appeared in five children living within five miles of each other in Massachusetts and in the same area as the equine disease. Brain tissue from fatal cases was examined at Harvard by Sidney Farber, pathologist at the Children’s Hospital, who joined Fothergill, Dingle, and M. L. Connerley in describing the cases, and by investigators at the Rockefeller Institute. The latter isolated EEE virus; the children died as secondary hosts of a virus that infects horses.

During the same epidemic, pigeon breeders in the area suffered unusual losses in their flocks. Fothergill and Dingle identified a virus from the brain of a dead pigeon as EEE virus, confirming the role of birds in the transmission cycle. Concurrently, Dingle contributed his immunological expertise to studies with Thomas Hale Ham of a rare form of hemolytic anemia, paroxysmal nocturnal hemoglobinurina, and interested Ham in studying the cold hemagglutinins associated with primary atypical pneumonia. Later, when both were at Western Reserve University—Ham at Dingle’s urging—they provided advice to the author when he had the opportunity to study two cases of syphilitic cold hemoglobinurina in the same year. By the time of his graduation from medical school, Dingle had contributed to twenty published papers. It is not surprising that he competed successfully for an internship at Children’s Hospital.

In 1940 he joined Maxwell Finland’s group at the Thorndike Memorial Laboratory, Boston City Hospital, as Francis Weld
Peabody Fellow in medicine and instructor in Zinsser's Department of Bacteriology and Immunology. He participated in early studies of sulfonamides, establishing the efficacy of sulfadiazine in the treatment of meningococcal meningitis, and collaborated with Lewis Thomas on investigations of the bacteriological and immunological aspects of meningococcal infections. This was at a time when the United States was mobilizing for World War II, and meningococcal meningitis was to become a threat to military populations. Dingle's first "field assignment" was to lead a Harvard team to investigate simultaneous outbreaks of diphtheria, scarlet fever, and meningococcal meningitis at Halifax, Nova Scotia, in January 1941.

Another disease of military importance was to shape Dingle's career and occupy his attention for the next quarter century. Primary atypical pneumonia was recognized as an epidemic respiratory disease, perhaps an entity, distinct from then-known viral pneumonia, in the late 1930s. Finland, an investigator particularly interested in pneumonia, had been seeing an increasing number of cases of nonbacterial pneumonia at Boston City Hospital by the time Dingle arrived, and a number of members of the house staff on the two Harvard medical services were being hospitalized with this diagnosis. Similar illnesses were occurring in military personnel in expanding recruit camps. In 1941, having been named a consultant on epidemic diseases to the Secretary of War and a member of the Commission on Influenza under the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army—the predecessor of the Armed Forces Epidemiological Board—Dingle was asked to join a group of medical scientists to investigate an outbreak of atypical pneumonia at Camp Claiborne, Louisiana. This short-term study led to the recommendation that a separate Commission on Acute Respi-
ratory Diseases be created, its investigators to conduct long-
term field and laboratory studies at an Army recruit base. The establishment of this commission at Fort Bragg, North Carolina, and the direction of its studies there for the next four years constitute one of the major achievements of Dingle’s career.

By October 1942 he had assembled an outstanding group of investigators, including Theodore J. Abernathy (internist), George F. Badger (biostatistician), Alto E. Feller (virologist), Alexander D. Langmuir (epidemiologist), and Charles H. Rammelkamp (internist). These physicians, augmented by Army medical officers, enlisted personnel, and civilian staff, decided to publish collectively as the Commission on Acute Respiratory Diseases. Dingle promoted this designation to emphasize that theirs was a team effort. His own brilliance coupled with his respect for and encouragement of the talents of others established him as a persuasive leader in a stimulating, congenial, and productive environment.

Among the major contributions to the development of knowledge of respiratory diseases in military personnel was the demonstration that at least three then uncultivable filterable agents were responsible for three clinically and epidemiologically defined illnesses: atypical pneumonia, the common cold, and an influenza-like illness of recruits characterized at Fort Bragg and labeled acute respiratory disease (ARD). This was accomplished by a series of carefully designed studies in volunteers.

Human subjects had to be used because the embryo-
nated egg and animal systems available in this pre tissue culture era yielded little other than influenza viruses. Rammelkamp toured the country recruiting volunteers from among conscientious objectors of several religious groups, and the commission took over a resort hotel in nearby Pinehurst in which to house them. Lacking spe-
cific serologic tests, the investigators could select suscep-
tible volunteers only on the basis of a history of recent
illness. They were fortunate in that filtered respiratory
secretions induced illnesses that resembled those from
which they were taken. Subsequent cross-over challenge experi-
ments confirmed differences in incubation periods of the
common cold and ARD agents and demonstrated homolo-
gous but not heterologous immunity, indicating that the two
agents were immunologically distinct and probably distinct
from the agent of atypical pneumonia. It is now known that
atypical pneumonia is caused not by a virus but by Myco-
plasma pneumoniae, ARD is caused by several adenovirus types
and can be prevented by a live oral vaccine; most, but not
all, colds are caused by any of more than 100 rhinoviruses.

After the war, the military decided that it still needed
the advice of the Army Epidemiological Board and the ex-
pertise of certain of its commissions. Dingle, who was to
continue as director of the Commission of Acute Respira-
tory Diseases until 1955, conceived the idea of applying its
epidemiological and laboratory methods to the study of
civilian populations and sought an academic base at which
to do so. Yale, with Francis G. Blake in medicine and a
Division of Public Health headed by John R. Paul, was con-
sidered, but Joseph T. Wearn, dean of Western Reserve
University’s School of Medicine, persuaded him to come
to Cleveland in 1946 to establish a new Department of
Preventive Medicine. Dingle’s decision was no doubt in-
fluenced by the willingness of local practitioners to coop-
erate by identifying families for pilot studies. He brought
three members of the commission—Badger, Feller, and
Rammelkamp—with him and recruited Richard G. Hodges,
a pediatrician who had conducted studies of pneumococ-
cal vaccine at an Air Force base with Colin M. MacLeod, to
join them. This group was later augmented by others,
including Floyd W. Denny, Jr., Harold S. Ginsberg, Sidney Katz, Lois P. McCorkle, Robert Oseasohn, and myself, as Dingle exercised his capacity to raise funds for the support of his department.

With the approval of the Board of Trustees of the Academy of Medicine of Cleveland, whose then-president, Chauncey W. Wyckoff, a pediatrician, encouraged participation by his patients, Dingle's staff eventually recruited eighty-six families, with 443 individuals, resident in middle-class suburbs within easy driving distance of the medical school to participate in what became known as the Cleveland Family Study. This longitudinal study of the occurrence of illness, all illnesses, in families with young children was largely descriptive because, apart from influenza, few respiratory viruses could be identified in those years. Although the bacteria that could be identified—*Haemophilus influenzae*, pneumococci, and streptococci—were comparatively infrequent causes of illness, the occurrence of multiple cases of acute glomerulonephritis in a family infected with the type 12 group A beta hemolytic streptococci was the clue that led Rammelkamp to postulate the existence of nephritogenic types, a postulate supported by studies of other populations. The high incidence of viral respiratory infections in the families, particularly in young children, was documented, and the relative importance of the home and school in their transmission was assessed. Similar data measured the passage of influenza epidemics, most notably Asian influenza in 1957, study of which necessitated reactivation of observation of the population, which had recently been discontinued after ten years of data collection. That this was possible is a tribute to the rapport Dingle had established with the parents and to the responsiveness of a staff devoted to his leadership.

When adenoviruses became available, it was shown that many children are infected by certain types early in life,
often without symptoms. Curiously, the adenovirus types responsible for ARD in military recruits were shown not to be important causes of illness in civilians. Other studies documented the ineffectiveness of an antihistamine for the treatment of colds and provided evidence for the existence of two kinds of nonbacterial gastroenteritis. A final note: all of the data were processed under the guidance of Badger without benefit of computers! A summary of this team effort was published in 1964.¹

Seldom, if ever, has a medical faculty paid more attention to undergraduate education than during Dingle’s tenure. Dean Wearn, himself a product of Harvard Medical School and the Thorndike Memorial Laboratory, had capped his opportunity to recruit eleven new department chairmen in a short period of time with the decision to reexamine the objectives of medical education, the content of the curriculum, and pedagogical processes. Hale Ham was recruited to conduct this “experiment in medical education,” and his friend and colleague Dingle became an active participant in the key committees and planning sessions that evolved. On occasion this led to faculty retreats at the dean’s home, which became both serious working sessions and pleasant social events. To promote relaxation after a day of intense debate, a self-appointed vocal group composed and presented songs relevant to this collective effort. Such was Dingle’s personality and warmth of fellowship that it was only natural this group should gather at his home, with him at the piano, to write its ditties.

The revised curriculum, introduced in 1952, incorporated subject committee teaching, early introduction of students to patients and families, project research, free time, increased emphasis on ambulatory care, and other approaches periodically rediscovered by medical educators. Dingle’s department assured the incorporation of empha-
sis on the scientific method and consideration of biostatistics, epidemiology, preventive medicine, and health care, as appropriate, throughout four years by having its staff interact with both basic and clinical scientists. A number of these staff members, with Dingle's blessing, went on to become department chairman at other institutions.

During and after World War II, Dingle was closely associated with a group of scientists with broad knowledge of infectious diseases and a concern for expanded basic and clinical research both at home and abroad. This group included Colin M. MacLeod, Thomas Francis, Jr., Joseph E. Smadel, and Theodore E. Woodward, who, with others, spent many days traveling the world at the request of James A. Shannon, director of the National Institutes of Health, or the White House, or the Department of Defense to select a site for a laboratory for the study of cholera, to negotiate collaborative agreements with the Japanese, or to assess progress at strategic military research laboratories. They, and others like them in other fields, laid the groundwork for an expanded U.S. effort in international health research.

National and international travel became more and more difficult for Dingle because of the slow progression of an undiagnosed musculoskeletal disease that plagued him from the age of eighteen. Weakness of his left leg, attributed without documentation to poliomyelitis, caused him to limp, and weakness of the left shoulder and arm appeared later. This was not sufficient to disqualify him from being commissioned a major, M.C. AUS in May 1944, with the rank of lieutenant colonel when deactivated in July 1946, nor did he later allow increasing disability to limit his participation in the activities of professional societies and advisory committees during twenty-four years as chairman of the Department of Preventive Medicine. His spirit is sym-
bolized by his determination to spend a year in Geneva as a WHO consultant in 1965–66 despite his need by this time for braces on both legs and a wheelchair for long stretches. By 1969 he was completely dependent on a wheelchair and made arrangements to have himself forklifted on and off airplanes in the days before jetways. Such was the affection felt for him by his colleagues that he never lacked companionship and a helping hand. Despite muscle biopsies and enzyme studies, his illness remained undiagnosed before and after his death from cardiopulmonary failure at the age of sixty-five.

During his years in Cleveland, Dingle enjoyed the blessings of a loving family. He had previously been married to Cornelia Eddy, Ph.D., a fellow bacteriologist, whom he met at Hopkins; they were married in October 1933 and divorced in June 1945, having had no children. At Fort Bragg, Dingle met Doris (Dottie) V. Brown, a native of nearby Fayetteville, while she was working as a secretary for the Commission on Acute Respiratory Diseases. They were married on January 18, 1946, and set up housekeeping in Cleveland Heights the following August. They had two children, Eva Meredith and David Rufus, with whom they delighted to return each summer to a rambling family cottage on the Intracoastal Waterway at Gause’s Landing near Shallotte, North Carolina. Even in later years when his disability limited him to the front porch, Dingle looked forward to this family vacation.

At home John and Dottie kept open house for the world. He loved to entertain and she was a marvelous hostess. They were generous with invitations to friends and faculty associates, attracting many to marathon sessions of duplicate bridge. Interest both in the Cleveland Family Study and in the curriculum experiment assured a steady flow of visitors, a high percentage of whom enjoyed the warm fellowship of the Dingle household where dry martinis were a
specialty and tasty food was assured, even with a different visitor or two every night.

Dingle served his community for twelve years as a member of the Cleveland Health Council and as its chairman during 1954–57. He was a member of the advisory boards of the Cleveland Health Department, the Maternal Health Association, and the Cleveland Diabetic Fund. He was an active member of the National Research Council's Subcommittee on Infectious Diseases and its successor, the Subcommittee on Infectious Diseases and Chemotherapy, for ten years, serving as chairman in 1950–53. He was elected to the National Academy of Sciences in 1958.

Dingle was a member of fifteen professional societies and served as president of three of them: American Association of Immunologists, American Epidemiological Society, and Central Society for Clinical Research. His numerous awards included the Legion of Merit and the Outstanding Civilian Service Medal from the Department of the Army, the Albert Lasker Award, the James D. Bruce Memorial Award of the American College of Physicians, and the Bristol Award of the Infectious Diseases Society of America.

Those who were privileged to know and work with John Dingle remember him as a creative medical scientist and teacher, a remarkably effective collaborator, an able administrator, a warm and thoughtful friend and colleague, and, above all, a noble citizen.

I AM INDEBTED TO Mrs. John H. Dingle and to George F. Badger and Theodore E. Woodward for supplementing my personal knowledge of John Dingle’s life and career.

NOTE

1932

1933

1934

1935

1936

1937


1938


1939


1940


1941


1942

1943

1944


1945


With the Commission on Acute Respiratory Diseases. The present


1946


With the Commission on Acute Respiratory Diseases. Outbreaks of


Primary atypical pneumonia. In *The Doctors Talk It Over* radio broadcast, sponsored by Lederle Laboratories. (Jan. 15.)


1947


1948


1949


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1950


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1951


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1952


1953


With G. F. Badger, A. E. Feller, R. G. Hodges, W. S. Jordan, Jr., and C. H. Rammelkamp, Jr. A study of illness in a group of Cleveland families. V. Introductions and secondary attack rates as indices of

1954


Plans and policies for future development of Western Reserve University School of Medicine and University Hospitals of Cleveland. Report of the Committee on Plans and Development, John Dingle, Chairman.

1955


1956


1957


1958


With W. S. Jordan, Jr., F. W. Denny, Jr., G. F. Badger, C. Curtiss, R.

1959

1960

1961

1963
1964


1965


1966


1967