OBITUARIES

William Hugh Feldman, D.V.M., M.S.
1892–1974

Dr. William Hugh Feldman, general pathologist, veterinary pathologist and skillful experimental pathologist, died in Rochester, Minnesota, 15 January 1974. His imprint on leprosy began in 1942 (1) when he and his associates reported that promin, a sulfone drug, was significantly effective in the treatment of experimental tuberculosis in guinea pigs. This prompted Dr. Guy H. Faget and his staff at the USPHS Hospital, Carville, La., to undertake an experimental trial of promin in leprosy. Their favorable report in 1943 (2) initiated the sulfone era in the treatment of leprosy.

Born in Glasgow, Scotland, 30 November 1892, Feldman was brought to the USA in 1894. He received the degree of doctor of veterinary medicine in 1917 and that of master of science in 1926 from the Colorado Agricultural College (now Colorado State University). Following graduation he was assistant professor of pathology at that institution for ten years. During that decade his published papers manifested his broad basic interest and knowledge in pathology and special interest in the neoplasms of lower animals. In 1927 he was appointed instructor in comparative pathology in the Mayo Graduate School of Medicine of the University of Minnesota and was advanced to professor in 1944. His alma mater awarded him an honorary D.Sc. degree in 1945. On retirement in 1957, he became chief of laboratory research in pulmonary diseases at the Veterans Administration, Washington, D.C., a position he held until 1967 when he returned to Rochester, Minn., as emeritus professor of pathology.

It was in the field of tuberculosis that Feldman made his greatest contribution to medicine. Shortly after his move to the Mayo Graduate School of Medicine and Mayo Clinic he began experiments on methods of inoculation to induce tuberculosis in laboratory animals and reported intracerebral infection as a useful technic. He was soon engaged in comparative studies of infection by different types of tubercle bacilli in different species of animals, laying a background that was useful for his own future studies and for a great many dedicated tuberculosis investigators in other laboratories. More than any other researcher he developed the field of comparative pathology of tuberculosis.

He had a unique capacity for working with others. In the mid-1930's his relations with clinicians and clinical tuberculosis grew closer. In the late 1930's he, H. C. Hinshaw and other collaborators entered on studies that revolutionized the treatment of tuberculosis. He and these associates, both in the laboratory and the clinic, became deeply interested in the chemotherapeutic effects of the drug Prontosil that was first known in 1932 and the large group of antimicrobial sulfonamide drugs that followed it. If these drugs had such extraordinary effects on micrococci, and specifically on severe infections due to pneumococci and streptococci, why should not similar drugs be effective in tuberculosis?

In 1940, with Hinshaw and A. G. Karlson, Feldman published studies of the effect of the sulfanilamide derivative sulfapyridine on

experimental tuberculosis that proved more promising than any drug studies yet made. Within a few months they and associates investigated a large number of related drugs. Their goal was stated quite clearly in their early papers, *viz.*, a drug to which the body was tolerant in doses adequate to exert an unequivocal repressive effect on tubercle bacilli in tuberculous lesions.

From then on the majority of Feldman's many published papers were in this general field. Out of a total of 292 papers, some 170, were in the field of tuberculosis, most of them on its chemotherapy. In October 1940 unusual success in experimental tuberculosis was reported with promin, a complex sulfone furnished by Parke, Davis and Co. As was noted earlier in this paper, this drug came to the attention of leprosy investigators and started a long train of chemotherapeutic investigations that still continues. It is noteworthy that with promin Feldman felt that they had "a foot in the door." It is to be noted, too, that a drug that later proved more useful in leprosy than promin, *viz.*, the simpler diaminodiphenylsulfone (DDS) was investigated by Feldman and his colleagues. Experiments by Feldman and numerous associates on promin were reported as late as 1948. By that time there was a considerable body of evidence that it was of some value in clinical tuberculosis but great care was necessary because of its toxicity. Investigation of other related drugs of promise, e.g., promizole, continued.

The great breakthrough came with a quite different type of drug, however, *viz.*, a product of a soil microorganism, *Streptomyces griseus*, designated streptomycin, which had been discovered by A. Schatz, E. Bugie and S. A. Waksman (1944) and found to have antimicrobial properties. Feldman visited Waksman's laboratory. Waksman welcomed a proposal for intensive work by Feldman and his colleagues on this drug.

The results are historic. Streptomycin became *the* drug for treatment of tuberculosis. A classic paper by Feldman, Hinshaw and F. E. Mann in 1945, in widely read tuberculosis literature, marked its advent. In clinical tuberculosis results were achieved that had never been seen before. The clearing shown in x-ray films of tuberculous patients under streptomycin treatment was extraordinary. Not surprisingly, some toxic problems became apparent, and the phenomenon of developing resistance to the drug was evident. Countless investigations in which Feldman and his associates took a highly active part, overcame many of the difficulties. In time other drugs with equal or greater efficacy and less toxicity, particularly isoniazid (1952) were developed in other laboratories, but streptomycin, still in use in selected cases, remains the first outstanding advance in the drug treatment of tuberculosis.

It may be noted here that in 1948 Feldman himself, became a victim of the disease. A year of sanatorium treatment and a year at home along with the best therapeutic measures available, proved effective in arresting the disease. The research in his laboratory did not stop. In 1949 a definitive book of multiple authorship edited by H. M. Riggins, and H. C. Hinshaw including numerous separate treatises by Feldman and his associates, was published by the National Tuberculosis Association.

In 1944 Feldman, F. C. Mann and Hinshaw received the gold medal award of the American Medical Association for a scientific exhibit illustrating their work on the chemotherapy of tuberculosis. In 1946 Feldman delivered the prestigious "Harben Lectures" of the Royal Institute of Public Health and Hygiene in London and received noteworthy recognition on presentations on chemotherapy in cities of continental Europe. In 1955 he was awarded the highly prized Trudeau Medal of the National Tuberculosis Association in the United States.

It should not be overlooked that Feldman was a highly competent veterinarian and comparative pathologist before his long series of investigations of tuberculosis began. His two valuable books *Neoplastic Diseases of Domestic Animals* (1932) and *Avian Tuberculosis Infections* (1938) were widely used. S. Z. Saunders, in an obituary published in VETERINARY PATHOLOGY (vol. 11, 1974) the official organ of the College of American Veterinary Pathologists, has drawn detailed attention to his remarkable achievements and signal honors in general veterinary medicine.

Feldman's broad interest in mycobacterial diseases naturally included leprosy. In 1948 he was an enthusiastic member of the Fifth International Leprosy Congress in Havana.

That same year he joined the International Leprosy Association, becoming a lifelong member and loyal supporter of the INTERNATIONAL JOURNAL OF LEPROSY. In 1948 he became associated with the Leonard Wood Memorial (American Leprosy Foundation) as a member of its Advisory Medical Board. During the remainder of his professional life he served the Memorial in many advisory capacities, either as an official member of its Advisory Medical Board or during statutory intermissions as a nonofficial advisor. He was a very close friend of James A. Doull, who was appointed medical director of the Leonard Wood Memorial in 1949.

As an eager participant in research conferences on leprosy, he was an active member of the first and second Carville conferences on the Research Potentials in Leprosy in 1956 and 1958, the LWM-Johns Hopkins University Symposium on Leprosy Research in 1961, and the Leonard Wood Memorial-Armed Forces Institute of Pathology Conference on Research Problems in Leprosy in 1965. As a member of the Eighth International Leprosy Congress in Rio de Janeiro 1963, he contributed a paper on the transmission of *M. leprae* to animals and joined the workshop on transmission.

Feldman was always an enthusiastic participant in sessions dealing with the transmission of *M. leprae* to experimental animals. He frequently emphasized the numerous animals in the tropical and subtropical areas of the Americas that had not been tried in leprosy. At the Rio Congress in 1963, he stated: "Future efforts must be directed toward discovery of an animal or several animals that will provide for rapid and vigorous pathogenesis of *M. leprae*. Pathogenesis should be characterized by distinctive consistent cellular response with the production of millions of *M. leprae* capable of transmission to other animals of the same species." It appears now that some species of the armadillo, indigenous to the Americas, may fulfill the requirements laid down in 1963 by Dr. Feldman.

Feldman was the recipient of honors, decorations and awards far too numerous to include here in full. His willingness to promote broad aspects of pathology was shown by his activities in professional societies. His capacity for leadership was exemplified by his service as president of three societies of pathology, the International Association of Medical Museums (later the International Academy of Pathology), the American Association of Pathologists and Bacteriologists, and the American College of Veterinary Pathologists (of which he was a founder and first president). He was a life member of the Scientific Advisory Board of the Armed Forces Institute of Pathology, Washington, D.C., an institution to which he contributed much. Realizing the interrelationship of diseases of man and animals he was largely responsible for bringing about the establishment of a Veterinary Pathology Branch at the Armed Forces Institute of Pathology.

Feldman had exceptional capacity for scientific illustration and informative display. All his life he was interested in museum demonstration and exhibition of the progress of experimental studies. Combined with this was rare talent in photography. He was a master in photographic personal portraiture and built up a unique collection of pictures of friends and colleagues in pathology and leaders in medicine. The group included 14 Nobel Prize winners. Noteworthily he supplemented this unusual collection with charming pictures of the homes of many of them. In 1972 the National Library of Medicine of the U.S. National Institutes of Health honored him with an exhibit of his portraits of pathologists and at that time Feldman presented the collection to this great library, where it is in constant use in medical historical studies.

Feldman was one of the most agreeable companions any research scientist could wish to have. His range of knowledge of experiment in the several fields of medical science in which he was a master was tremendous. Conversations with Bill Feldman were fascinating and tinged always by his wit and friendly and pervasive good humor. He was chairman of many committees. Their meetings were rich in accomplishment and invariably overlaid with the Chairman's own warm personality.

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