OBITUARIES

George Hirst Bradley

1893–1983

(Photograph taken about 1953, courtesy of CDC, Atlanta)

Dr. George Hirst Bradley was born in Patch Grove, Wisconsin, July 14, 1893 and died at age 90 in Rome, Georgia, October 17, 1983. He studied at elementary and high schools at Hornell, New York. When he decided to attend Cornell University in 1912 to study agriculture, he needed part-time work, so he collected laboratory specimens for the general biology course which was given by the entomology department of the College of Agriculture. This work brought him in contact with such inspiring teachers as Professors J. G. Needham, W. A. Riley, O. A. Johannsen, and Robert Matheson and led to his interest in insects. Upon graduation in 1916, he registered for an advanced degree and was appointed as one the teaching assistants in the biology laboratory.

In June 1917 Dr. W. A. Riley recommended that he take a position with the U. S. Bureau of Entomology at a new laboratory at Mound, Louisiana where he worked with Mr. D. L. Van Dine and Dr. W. V. King on malaria and mosquito surveys and biological studies. When World War I began, he served in the U. S. Army attaining the rank of infantry Captain.

Following World War I, Dr. Bradley returned to Mound, Louisiana where he worked with Dr. W. V. King and Mr. T. E. McNeel until 1931, when they transferred to Orlando, Florida. He continued to work for the U.S., Department of Agriculture until 1941. In 1926 King and Bradley were the first to demonstrate that anopheline mosquito larvae could be controlled by airplane application of paris green insecticide, a technique widely used for the next 20 years. During the 1930's Dr. Bradley served as a special consultant on salt marsh mosquito control and advised on

miles of drainage ditching at Works Progress Administration (WPA) projects. While at Orlando, King, Bradley, and McNeel conducted studies on anopheline and culicine mosquitoes. As a result of their studies on the *Anopheles crucians* complex, Dr. King named the salt-marsh form *Anopheles bradleyi* in Dr. Bradley's honor. Later studies on all the North American *Anopheles* resulted in the publication of several papers on these insects in "Human Malaria." Their best-known publication, "The mosquitoes of the southeastern United States" by W. V. King, G. H. Bradley, and T. E. McNeel was originally published in 1939 and revised and expanded in 1942, 1944 and 1960. These publications were widely used by public health workers, particularly during World War II.

In 1941 Dr. Bradley transferred to the U. S. Public Health Service and trained many entomologists at New Smyrna Beach, Florida. In 1942 he transferred to the headquarters of the new Office of Malaria Control in War Areas (MCWA) at Atlanta, Georgia, under the direction of Dr. L. L. Williams, Jr. in 1942 and 1943 and Mr. M. D. Hollis until 1946. For many years Dr. Williams had promoted the idea of a malaria control unit in state health departments directed by a physician-entomologist-engineer team. Therefore, Dr. Williams followed this same concept in the new MCWA organization with Dr. T. H. Stubbs as Chief of the Medical Division, Dr. Bradley as Chief of the Entomology Division, and Mr. Nelson H. Rector as Chief of the Engineering Division. A fundamental determination was made at the beginning of the MCWA program that operations would be focused on the specific vectors of malaria: *Anopheles quadrimaculatus* and *An. freeborni* in the United States and *An. albimanus* in the Greater Antilles. Such selective control measures were made possible by utilizing entomological survey and inspection services to the fullest extent consistent with efficient management. This procedure reduced the central costs an estimated 15 million dollars during the war.

The MCWA program was carried out in areas contiguous to military reservations and major war production installations and surpassed in magnitude anything previously known. During the period of maximal military training and industrial production, the MCWA control operations involved larviciding, draining and filling of watered areas at approximately 2200 localities in 15 southeastern states, California, Hawaii, and parts of the Caribbean. Dr. Bradley's duties consisted of planning the entomological activities, recruiting and assigning entomologists to specific areas, and supervising and analyzing results of malaria control operations. Subsequently he became involved with other vector-borne diseases, such as dengue in Hawaii which occurred in 1943.

Dr. Bradley played a key role in having entomologists become commissioned officers in the Reserve Corps of the U. S. Public Health Service beginning in 1943 and in the Regular Corps in 1946. During Dr. Bradley's tenure as Chief of the Entomology Division, more entomologists and engineers worked on vector control programs than at any other time in the history of the Public Health Service.

When World War II ended, the personnel directed by the physician-entomologist-engineer team of MCWA were assigned to a new Public Health Service organization, the Communicable Disease Center (CDC), officially beginning July 1, 1946. Dr. Bradley continued as Chief of the Entomology Division until 1952. He was concerned with the entomological aspects of three important programs. The Malaria Eradication Program, which included 6,500,000 DDT-residual-house sprayings in the southeastern United States from 1945 to 1952, resulted in the cessation of malaria transmission in this country, except for a few isolated cases. The Murine Typhus Control Program emphasized better sanitation, rat stoppage, and the use of new rodenticides such as ANTU, 1080, and the anticoagulants to control the rodent reservoir of the disease, and DDT-dusting of rat burrows and runways to kill the flea vectors. This was one of the earliest examples of what is now known as an integrated pest management (IPM) program. The number of reported cases of murine typhus dropped remarkedly from 5401 in 1944 to 205 in 1952, when the program was terminated. The Fly-Borne Disease Control Program was initiated to demonstrate the feasibility of reducing the incidence of diarrheal diseases associated with flies. Important contributions were made in sanitation, fly biology, new insecticides, and insecticide resistance. Dr. Bradley also gave strong support to investigations and control aspects of other CDC vector-borne disease programs such as encephalitis and plague. During his work with CDC, he studied parttime with Dr. Robert Matheson at Cornell University and received his Doctor of Philosophy degree in medical entomology.

Dr. Bradley served as Assistant Chief of CDC in Washington beginning in 1954. He retired from the commissioned corps of USPHS, with rank of Scientist Director, in 1957. He continued as Assistant Chief of CDC in Washington, D. C. in a Civil Service status until his final retirement in 1963. Following his retirement, Dr. and Mrs. Bradley lived in Rome, Georgia until his death, October 17, 1983.

Dr. Bradley married Nancy McMurry on December 30, 1922. They had two sons: G. H. Bradley, Jr. of Albuquerque, New Mexico and John B. Bradley of Natchitoches, Louisiana, nine grandchildren and three great grandchildren. Mrs. Bradley will live with her son, John B. Bradley, P. O. Box 771, Natchitoches, LA. 71458.

Dr. Bradley belonged to many organizations, including the American Mosquito Control Association (Honorary Member, 1964), National Malaria Society (President, 1944), Entomological Society of America, and American Legion. He was an excellent administrator, and one of the finest gentlemen and strongest supporters of professional entomology we have ever known.

Harry D. Pratt
John H. Hughes
Donald R. Johnson
U. S. Public Health Service
(retired)
Atlanta, GA.

SIGNIFICANT PUBLICATIONS

Bradley, G. H. 1951. Public health interests in mosquito control. Proc. N. J. Mosq. Exterm. Assoc. 1951:59–61.
Bradley, G. H. 1966. A review of malaria control and eradication in the United States. Mosq. News 26:462–470.
Bradley, G. H. and F. O. Atchley. 1953. The *Aedes aegypti* situation in the United States. Proc. N. J. Mosq. Exterm. Assoc. 1953:104–108.
Bradley, G. H. and W. V. King. 1941. Bionomics and ecology of Nearctic *Anopheles,* pp. 79–87. *In* Human Malaria. Am. Assoc. Adv. Sci. Pub. 15.
King, W. V. 1939. Varieties of *Anopheles crucians* Wied. Am. J. Trop. Med. 19:461–471. (Description of *Anopheles crucians bradleyi* King)
King, W. V. and G. H. Bradley. 1926. Airplane dusting in the control of malaria mosquitoes. J. Trop. Med. Hyg. 29:311–313.
King, W. V. and G. H. Bradley. 1941. General morphology of *Anopheles* and classification of the Nearctic species, pp. 63–70. *In* Human Malaria. Am. Assoc. Adv. Sci. Pub. 15.
King, W. V. and G. H. Bradley. 1941. Distribution of the Nearactic species of *Anopheles,* pp. 71–78. *In* Human Malaria. Am. Assoc. Adv. Sci. Pub. 15.
King, W. V., G. H. Bradley, and T. E. McNeel. 1944. The mosquitoes of the southeastern United States. U. S. D. A. Misc. Pub. 336, rev. 96 pp. (Originally published in 1939; revised 1942, 1944 and 1960).
Kitzmiller, J. B. 1982. [*Anopheles*] *bradleyi* [biography of G. H. Bradley], pp. 84–87. *In:* Anopheline names: Their derivations and histories. Vol. 8, Thomas Say Foundation, Entomol. Soc. Am.

OBITUARY

Paul Farr Russell*
1894–1983

Dr. Paul Farr Russell, one of the world's leading malariologists, died in Richmond, Virginia, in his 89th year.

The son of a Baptist minister, Paul Russell was born in Boston, Mass. in 1894 [August 12] and received his medical degree at Cornell University Medical School. Encouraged by his devout parents, the young doctor decided that he would employ his professional knowledge to help the sick people in distant parts of the world. After completing two years of internship at the Bellevue Hospital in New York, Paul joined the Rockefeller Foundation in 1923 as staff member of the International Health Division. His first field assignment was to Singapore and to Malaya, to carry out the Foundation's rural sanitation programme, linked with the attempted eradication of hookworm. He was then transferred to the Philippines to study and control malaria, a serious local problem. From then on Russell committed himself wholeheartedly to research and fight against this disease. In 1935, having spent 5 years in the Philippines, where he carried out a remarkable study of rural malaria, Russell went to India, to set up at the King's Institute in Madras a malaria

* Reprinted with permission of the author and The Lancet, London.