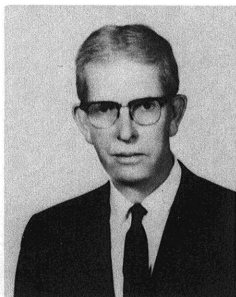


Harold Hall McKinney, 1889-1976

R. A. Kilpatrick and M. K. Brakke



Harold Hall McKinney, retired U. S. Department of Agriculture cereal and tobacco virologist and pathologist, died October 2, 1976, in Arlington, Virginia. He was born in Cherryvale, Kansas, February 2, 1889, and attended public schools in Salt Lake City, Utah. A BS degree was received from Michigan State University in 1918 and the MS degree in 1920

from the University of Wisconsin in plant pathology. He continued graduate studies until 1924. In 1911, Harold married Pansy Hiatt and together they raised two sons.

In 1918, McKinney participated in the stem rust eradication program. He joined the then Bureau of Plant Industry, U.S. Department of Agriculture, in 1919 as assistant plant pathologist at Madison, Wisconsin, where he worked with L. R. Jones. Soon after entering the USDA, he became embroiled in a bitter struggle concerning identification of a disease affecting wheat that resembled "take-all", which was known in Australia. He soon found that the opinions of experts were contrary to his and that developing convincing arguments to support his ideas must be his goal. Since his assignment had been to work on the *Helminthosporium* diseases of cereals, he was advised to tread lightly on those in authority. After months of arguments, in which tempers flared and friendships diminished, he was able to demonstrate that the disease affecting wheat in Illinois and Indiana was not "take-all", but a new virus disease which he named "rosette". This was the first description of a soil-borne virus, and McKinney continued to work on it until he retired.

Some protozoologists claimed that the inclusion bodies were protozoa, but they also maintained that other structural features of plant cells, even including nuclei, were protozoa. McKinney showed that some of the so-called inclusion bodies were normal components of plant cells, and distinguished these from the intracellular inclusions associated with virus diseases.

McKinney continued his studies on the soil-borne wheat mosaic virus, showing that it infected rye, studying its survival in roots and soil, and eventually concluding that it had a soil organism as a vector, another first.

In 1926, McKinney moved his family to Arlington, Virginia. For the next few decades, he was regarded as one of the most outstanding cereal virologists in this country. He worked on every virus disease of cereals that was described during the era. He continued his research on tobacco viruses and collected many of these during a trip to West Africa and the Canary Islands in 1926 for the Allison Armour Foundation. These viruses, and

particularly the strains of tobacco mosaic virus, provided materials for the problem that fascinated him most, the biological interaction of plants and viruses.

"Mac" was the first to suggest that viruses could mutate, a conclusion he reached during his Ph.D. research. This conclusion was not accepted by his advisors, and the resulting disagreement was a major contributing factor in his departure from graduate studies without a Ph.D. degree. He retained a lifelong interest in genetics of viruses and the study of virus symptoms in mature plants. He was the first to suggest and demonstrate the principle of cross protection between strains. He noticed the similarity between virus-induced and genetic-induced mosaics and suspected an interaction between viruses and hosts at the genetic level long before such interactions were shown for animal and bacterial viruses. After he retired, McKinney collaborated with George Sprague and they demonstrated a genetic interaction between maize and barley stripe mosaic virus, the "aberrant ratio" effect.

"Mac" standardized his systemic assay procedures on quantitative techniques. He was the first to concentrate plant viruses by centrifugation, but then dropped the *in vitro* study of viruses to direct his efforts to the interaction of plants and viruses. Besides his studies on strains, he also studied the effects of temperature and photoperiod on symptoms, and the change in protein in infected plants.

Mr. McKinney demonstrated that viruses in host tissue could be preserved by calcium chloride desiccation of tissue. Prior to his death, he was able to assemble the USDA Cereal Investigation Virus Collection, now located at the Plant Pathology Department, North Dakota State University, Fargo, North Dakota. The present curator of the collection is R. G. Timian.

Mr. McKinney was a man dedicated to research. He was his own man in every respect, and was awed neither by officialdom nor by traffic rules. To ride with him as he drove through Washington struggling to keep his pipe lit was a memorable experience. He retired officially in 1959, but continued his research until he died. "Mac" published widely; during the first six years of his professional career he authored or co-authored 25 manuscripts. He published a total of more than 135 papers during his life-time. Of these, 18 were published after his retirement. At the time of his death, he had one manuscript in press and three more were being written. "Mac" was persistent in his ideas and convincing with his results. The contributions he made with cereal virus diseases and genetics of viruses will be utilized by many. His counsel and advice were valued by his profession and colleagues. He was a life member of APS and served on several committees. Bound volumes of his reprints are located in the Mycological Library, BARC-West, Beltsville, Maryland 20705.