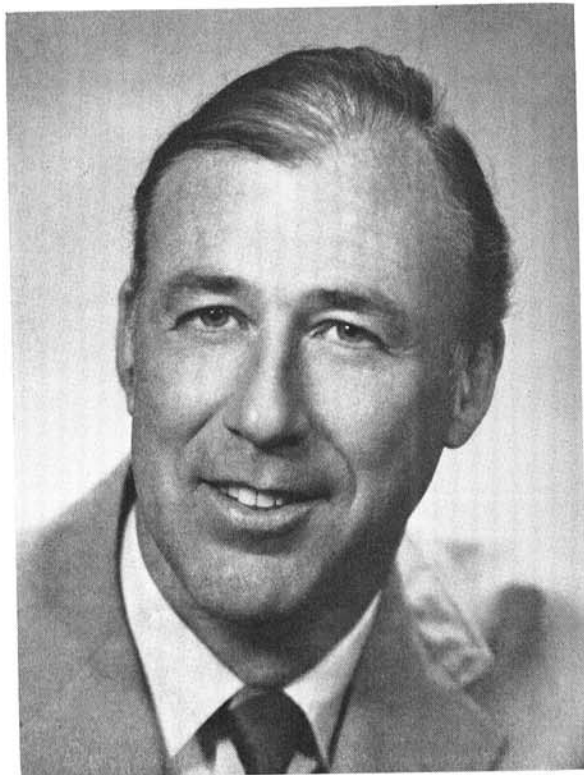


Ruth Allen Award

In 1965, the Ruth Allen Memorial Fund was established by means of gifts from the executor of the will of Ruth Allen, Cecil Yarwood, and from her heirs: Sam Emsweller, Mabel Nebel, Hally Sax, and Evangeline Yarwood. The award, consisting of a certificate and the income from the invested fund, is to be given for outstanding contributions to the science of plant pathology. The 1970 recipient was John B. Bancroft; the award was announced at the 1970 Annual Meeting in Hot Springs, Arkansas.



John Basil Bancroft was born December 31, 1929, in Vancouver, British Columbia, Canada. He received the B.A. degree under F. Dickson at the University of British Columbia in 1952, and a Ph.D. degree in plant pathology under G. S. Pound at the University of Wisconsin in 1955. He joined the staff of the Botany and Plant Pathology Department at Purdue University the same year and reached the professorial rank in 1964. He took leave from Purdue in 1970 to become Head of the Virus Research Department, The John Innes Institute, Norwich, England.

Early in his career, Dr. Bancroft investigated the properties of alfalfa mosaic virus and, in collaboration with P. Kaesberg, discovered that the virus had bacilliform particles which sedimented as several species. This observation led to his general interest in the various properties of several viruses with two or more different nucleoprotein particles, and resulted in the explicit demonstration by Bancroft and his associates that such components of a virus species could interact, intraspecifically but not interspecifically, to enhance infectivity ten- to twentyfold. This finding established general approaches used by many workers in subsequent

studies of multicomponent viruses. Virology had been dominated by the concept that all infectious particles in a virus species were identical in much the same sense as all molecules of one chemical were considered to be identical. Although it had been known that extracts from virus-infected plants may contain such elements as a soluble antigen related to the protein coat of the virus, fragments of virus rods, or protein shells free of nucleic acid, these findings did not present a challenge to the prevailing concept described above. These components were commonly regarded as un-assembled virus constituents or as products of virus degradation. This discovery of enhancement resulting from combinations of nucleoprotein components provided an important impetus to researches by several investigators that contributed to a radically different conception of plant viruses. Many are now thought to have a genome which is divided between two or more native nucleoprotein particles which not only interact to produce infection but also interact to produce a variety of genetic combinations within a species.

Bancroft also attempted to discover why spherical viruses lost infectivity with increasing duration of infection in plants. Investigations in his laboratory led to one of the early detailed reports on the physical condition and infectivity of RNA for spherical viruses, and showed clearly for the first time that nucleic acid may be degraded inside virus particles as they are stored *in vivo*.

In 1965, while in Markham's laboratory in Cambridge, England, Dr. Bancroft realized how certain procedures could be exploited in self-assembly experiments with polyhedral viruses and their proteins. These methods led to the *in vitro* assembly of a polyhedral virus. Viruses containing foreign nucleic acids were also formed *in vitro* by Bancroft and his associates, as were particles of various aberrant forms, including those whose coats contained protein from more than one viral species. A general theoretical framework, consistent with the behavior of the natural viruses involved, was generated by detailed studies of the conditions under which they disassembled and assembled. Apart from actually showing that spherical viruses do self-assemble, these studies provide an experimental basis for approaches hitherto unavailable for the study of the behavior of such viruses.

In 1965, Dr. Bancroft was awarded a NSF Senior Postdoctoral Fellowship to work at the Virus Research Institute in Cambridge, England. He received the Sigma Xi Research Award of 1968 for Purdue University. He has served on the editorial boards of *Phytopathology*, *Virology*, and the *Journal of General Virology*.