

George Long Marsh, Food Science and Technology: Davis

1901-1994

Professor Emeritus

Food Technologist in the Experiment Station, Emeritus

George Long Marsh was born in San Francisco on June 15, 1901 to Robert Byers and Gertrude Clark Marsh. He attended Sutro Grammar School and graduated from Polytechnic High School in 1919. He started his university education at the University of California Berkeley in 1920, where he received his bachelor of science degree in 1931, majoring in horticulture. During his undergraduate years, he also worked periodically as a chemist for several employers, including the R.C. Bulgar Company, a producer of orange concentrate and candied citrus peel products used by bakeries, the California Walnut Growers Association and as a laboratory assistant at UC Berkeley where he was supported by a grant from the Paperboard Industry Association.

His academic development as a graduate student at Berkeley continued in September 1931, supported by a research assistantship in the Division of Fruit Products that was chaired by Professor W.V. Cruess. In 1934 he was awarded the master of science degree in agricultural technology. In that year Professor Cruess offered him the appointment of Associate in the Agricultural Experiment Station, which he accepted. In 1943 he was advanced to Lecturer in Food Technology and Assistant Chemist in the Experiment Station. Three years later he was promoted to Assistant Professor and in 1949 to Associate Professor. In 1951 most of the faculty of the department, then under the chairmanship of Emil Mrak, moved from Berkeley to a new building on the Davis campus. In 1953 George was promoted to Professor of Food Technology and Food Technologist in the Experiment Station. He retired to emeritus status on July 1, 1968, having reached the then-mandatory retirement age of 67, but continued his research on a part-time basis. His association with the University of California of nearly 75 years came to an end with his death in 1994.

George was a meticulous analytical chemist who worked effectively and constructively with colleagues and students in his and related departments on numerous problems in the complex field of food technology and the wine industry. The first paper listed in his extensive bibliography of 100 technical and numerous semi-technical publications was an article dated 1929 with W.V. Cruess on the detection and quantitative determination of carbon disulfide residue in almonds treated with this fumigant for control of insect infestation. During the following active 50-plus years, many other analytical methods and food processing procedures were investigated. From 1929-1942 he collaborated closely with his departmental colleague Maynard Joslyn on the basic principles of freezing preservation of fruits and vegetables, inactivation of enzymes in vegetables during blanching prior to freezing, flash pasteurization and aseptic packaging, frozen fruit concentrates and beverage bases. In 1950, in cooperation with Professor Cameron, he discovered the important effect of root stock on development of bitterness in naval orange juice concentrate. George also collaborated effectively with other departmental colleagues in research projects to produce superior dehydrated cut fruits by a combination of blanching and suffering prior to drying the fruit in a dehydrator rather than in the sun. Their results were published in a 68-page *Bulletin of the Agricultural Experiment Station*, which also described engineering aspects of this new preservation method.

In 1933, the year of Prohibition repeal, George directed some of his faculty to confront problems facing the wine industry. The lack of experienced people in that industry meant that great demands were being made upon the University for help in restarting enology research and practice. George and other staff

traveled a great deal and organized numerous conferences and meetings on cooling, use of sulfur dioxide, yeast cultures, filtration and so on. George worked primarily on the effect of cooling on the different phases of wine fermentation, which in turn led to work on tartrate stability and the use of refrigerated holding tanks for tartrate deposition. He developed a recovery process of potassium bitartrate from lees and distillery material that contributed in an important way to the national effort to overcome critical shortages of this compound during World War II. This study also helped the wine industry to maintain its status as an essential industry. Also of importance were his observations on the role of protein in the development of cloudiness in wines by copper complexes and its control by Bentonite treatment. The "Marsh Tables" for recovery of proof gallons of alcohol from wines, which he developed in 1951 with the Technical Advisory Committee of the California Wine Institute, are still useful today. Further evidence of his high standing in the California wine industry comes from his appointment as a wine judge at the California State Fair from 1937-1966.

George developed and taught a course "Principles of Food Preservation" for many years. He was deeply interested in the welfare of his students. Besides being an undergraduate advisor for the major, he was active for a long time in Academic Senate committees dealing with student affairs, such as the Regents Scholarship Committee, the Board of Admissions and Relations with Schools, and Student-Faculty Relations.

George was a member of the American Chemical Society, The American Association for the Advancement of Science, Sigma Xi, a charter member of the Institute of Food Technologists, a charter member of the California Wine Institute Technical Advisory Committee, and the American Society of Enologists (Vice-President 1964-65, President 1967). In recognition of his outstanding achievements in enology and with meritorious service to the wine industry, he was presented with the Society's most prestigious Merit Award in 1963.

George Marsh married Gertrude Evelyn Bee of Santa Rosa, California, and is survived by two daughters, Avonia M. Dondero of Orinda, California and Marilyn M. Wilson of Denver, Colorado.

M.W. Miller V.L. Singleton H.J. Phaff