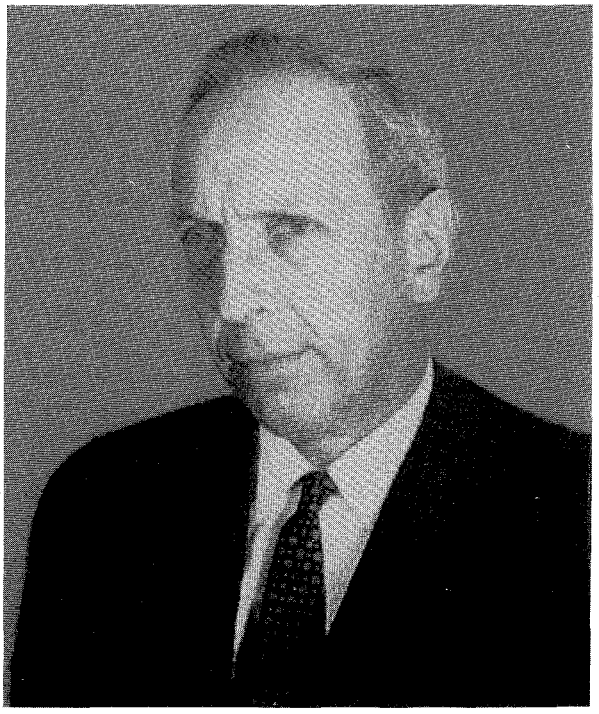

IN MEMORY

George M. Byram
1909-1996

" . . . The relatively slow development of the field of uncontrolled fire as a science probably can be attributed to two main causes . . . . the primary cause appears to have been the absence of any large and concerted effort in the field of uncontrolled fire even though foresters, urban communities, and many segments of industry have a large stake in better fire behavior knowledge . . ."

Forest fire research lost one of its true pioneers on April 12, 1996, when George M. Byram passed away in Dunedin, Florida, at the age of 87. He made lasting contributions in nearly every subject matter area of forest fire research. He was also a gifted painter and a fine gentleman in the eyes of those who knew him.

George was born in Burns, Oregon, and grew up on a farm in nearby Canyon City. He received his B.A. from Reed college in Portland in 1932 and began working for the U.S. Forest Service that same year. He later took a year of graduate study in physics at the University of California in Berkeley. He joined the Appalachian Forest Experiment Station in Asheville, North Carolina, in 1936. The story of how George traveled east to work in fire research is appropriate here. He and other Forest Service researchers attending a national meeting in Portland were taking a nightly stroll when they spied a car in a store window with one of its wheels spinning at constant speed. The car, rumble seat included, was offered to the person who could correctly guess the rpm of the wheel. George promptly retrieved a stroboscope, measured the rpm, and won the car. A friend from the Appalachian Station was so impressed he persuaded George to become a staff member there.

George recognized the need for precise definitions and quantitative measures of fire behavior, and his research advanced forest fire behavior well along the road toward becoming a quantitative science.

George was an expert in the optics of vision. In the 1930's and 1940's, he designed and built several meters for measuring atmospheric transparency and showed how to use them for estimating the visual range of small smoke columns. He developed theories relating human visual acuity to the brightness contrast of these columns. This work provided basic information for training lookout observers and operating lookout systems around the world. The results from his field studies of fire temperatures, fire intensity, and heat tolerance of plants provided fundamental information concerning the effects of fire on living vegetation. During this period he also determined wind speed-solar radiation-fuel temperature relationships and pointed out the significance of these factors in the drying of forest fuels.

In the early 1950's, George began his case studies of many of the country's major wildfires. He soon understood the role of fire whirlwinds in fire behavior and realized that blowup fires are not simply large-scale versions of small fires. His ideas concerning the significance of the wind profile and fire intensity in fire behavior led to hypotheses about conditions conducive to blowup fires that are still being used by NOAA fire-weather forecasters and by state fire control organizations. He summarized the application of concepts in combustion, heat transfer, and meteorology to forest fire problems in Chapters 3 and 4 of the 1959 book *Forest Fire: Control and Use* by Kenneth P. Davis. These chapters, which present information on combustion of forest fuels and on the basics of forest fire behavior, are as relevant today as when George wrote them.

In the 1960's, George continued his work on fire behavior with laboratory studies of several fire phenomena. His experimental and theoretical work on scale models of fire whirlwinds led to a better understanding of how these whirls contribute to wildfire propagation. His studies of both stationary and spreading fires included one of the first derivations of scaling laws for studying rates of spread and convective features of large-scale wildfires by means of smaller laboratory fires.

In addition, George made notable contributions in other areas of fire research. In fire-danger rating, for example, he suggested the timelag concept as a means of classifying fuels according to their drying rates and completed the technical development of the Keetch-Byram drought index. A not insignificant contribution was his

willingness to become an advisor to his co-workers and other Forest Service fire research colleagues.

In 1949, George received a Superior Service Award from the U.S. Department of Agriculture. He was commended by the operations Research office, U.S. Army, for outstanding work in Berkeley, California, on an Armed Forces Special Weapons Project in 1950-1951 to determine the effect of atomic explosions on wildland areas. His original research on blowup fires was recognized by the U.S Department of Agriculture in 1965 when he was named to lead a Pioneering Research Unit in Forest Fire Energy Systems at the Southern Forest Fire Laboratory in Macon, Georgia.

Perhaps the feelings of many in the wildland fire research community are expressed best in the words of Thomas F. McLintock, a former Director of the Southeastern Forest Experiment Station, who upon learning of George's imminent retirement wrote to him in 1968: "You have provided the kind of informed and imaginative leadership in a difficult and complex field of science which cannot be matched or replaced. The unique blending of mathematics and physics which you have used so skillfully to explore the basic laws and reactions of fire not only gave us badly needed fundamental knowledge, but has been a major determinant in establishing forest fire research on a solid scientific foundation."

Ralph M. Nelson, Jr.
(a member of George Byram's research
work unit from 1963-1968)