

## FOREWORD

THIS IS THE TWENTY-THIRD VOLUME in the Memorial Tributes series compiled by the National Academy of Engineering as a personal remembrance of the lives and outstanding achievements of its members and international members. These volumes are intended to stand as an enduring record of the many contributions of engineers and engineering to the benefit of humankind. In most cases, the authors of the tributes are contemporaries or colleagues who have personal knowledge of the interests and engineering accomplishments of the deceased.

Through its members and international members, the Academy carries out the responsibilities for which it was established in 1964 as an organization of outstanding engineers. Members are elected by their peers on the basis of significant contributions to engineering theory, practice, and literature or for exceptional accomplishments in the pioneering of new and developing fields of technology. The National Academies of Sciences, Engineering, and Medicine share a responsibility to advise the federal government on matters of science, technology, and medicine. The expertise and credibility that the National Academy of Engineering brings to that task stem directly from the abilities, interests, and achievements of our members and international members—our colleagues and friends—whose special gifts and accomplishments we remember in these pages.

Carol K. Hall  
*Home Secretary*



# Memorial Tributes

NATIONAL ACADEMY OF ENGINEERING