
FOREWORD

On March 3, 1901, Congress enacted the law that gave birth to the National Bureau of Standards (NBS), renamed the National Institute of Standards and Technology (NIST) in 1988. Although the bill defining NBS was only two pages long, the words carried much importance because the United States desperately needed a standards and measurement agency. To quote a committee report to the House of Representatives 10 months earlier: "It is therefore the unanimous opinion of your committee that no more essential aid could be given to manufacturing, commerce, the makers of scientific apparatus, the scientific work of the Government, of schools, colleges, and universities than by the establishment of the institution proposed in this bill." Today, these words adorn the entrance to the NIST headquarters in Gaithersburg, Maryland, and continue to inspire the staff.

Over the years NBS and NIST have made great contributions to these objectives and to the welfare of our country by distributing critically evaluated reference data and carefully certified reference materials and by developing reproducible measurement standards, including those of time, frequency, length, voltage and resistance that are now based on durable and reproducible quantized quantities. NIST scientists have also contributed to basic science in many ways, such as measuring the fundamental physical constants and showing the invalidity of the assumed parity symmetry for elementary particles. NIST continues to contribute to industry, computer science, health, medical science, safety, fire protection and other fields through its development of standards, quality assurance, and new technologies such as computer controlled manufacturing.

In the year 2001, NIST will be celebrating its Centennial, honoring and recognizing its contributions to the world of science and technology, American industry, and the economy over the last 100 years. The theme for this celebration is "NIST at 100: Foundations for Progress." The history of the Institute's first 50 years was covered by *Measures for Progress*, which was published in 1966 by the U.S. Department of Commerce. It captures the achievements through which NBS expertise fostered the technological changes in our country during a time of revolutionary advances in science and technology, driven in part by the development of quantum mechanics and two world wars. *Measures for Progress* was followed by the publication of *A Unique Institution*, a history of the Institute between the years of 1950-1969, years heralding the dawn of the Information Age.

This new volume, *Responding to National Needs*, covering the years 1969-1993, describes further scientific and technological advances and the evolution of NIST into an Institution that has also impacted and helped U.S. private industry and interests on

a global basis. For example, the Advanced Technology Program has aided the development of innovative technologies that brought many new products and services to market. The Baldrige National Quality program has emphasized quality as a national priority necessary to compete in a global marketplace, and the Manufacturing Extension Partnership has helped many small U.S. manufacturers enhance their global competitiveness by providing information and assistance on manufacturing technologies. At the same time, NIST, through its own efforts and through Precision Measurements Grants, has continued to make fundamental contributions to science and engineering, such as improved atomic clocks, the discovery of the first anapole moment, laser cooling of ions and atoms, and pioneering research that led to the observation of a Bose-Einstein Condensate in 1995. This book records the rich recent history of NIST and illustrates its many contributions to knowledge, technology, and society.

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