Introduction

ASTM has provided leadership in generating information on atmospheric corrosion since 1906 when the first ASTM exposure program was initiated. Much of the early test work was aimed at evaluating the effective life of protective coatings so that meaningful specifications could be written. In 1964, Committee G-1 on the Corrosion of Metals was formed, and its scope included "the promotion and stimulation of research" and "collection of engineering data relating to the corrosion of metals." Subcommittee G01.04 on Atmospheric Corrosion has pursued these goals through a series of symposia that have resulted in Special Technical Publications (STPs).

The first of these symposia was held in Boston, MA, 25-30 June 1967 and resulted in ASTM STP 435 [*1*]. The next symposium was held in Philadelphia, PA, 24-29 June 1973, and the papers were published in STP 558 [*2*], together with the papers of two other symposia. The Golden Anniversary Symposium commemorating 50 years Atmospheric Exposure Testing at the State College Rural Test Site was held at Pennsylvania State University, State College, PA, 18-19 May 1976, and the papers were published in STP 646 [*3*]. The Symposium on Atmospheric Corrosion of Metals was held in Denver, CO, 19-20 May 1980 and resulted in STP 767 [*4*]. The approach of using symposia has allowed wide participation and more comprehensive coverage of the subject. Contributions from sources outside the United States have also given these publications an international scope.

The Symposium on Degradation of Metals in the Atmosphere was organized as a continuation of the atmospheric corrosion series. The following goals were identified for the symposium:

- to highlight the performance of new alloys and metallic combinations, including metallic coatings,
- to report on the behavior of metals and alloys used in atmospheric service,
- to provide updated information on the effects of sulfur oxides and other accelerators of atmospheric corrosion,
- to report on studies showing correlation between atmospheric exposure results and laboratory tests designed to simulate atmospheric service, and
- to discuss the development and use of standards to control and minimize the atmospheric corrosion of metals.

The atmosphere has undergone significant changes in the past two decades in the United States. The efforts to reduce air pollution levels have resulted in significant reductions in ground level sulfur dioxide concentration, together with reduced lead content in particulates near highways. However, the use of tall stacks on coal fired electric power generating facilities has created widespread concerns about acid precipitation. Increased usage of deicing salts to maintain ice and snow-free thoroughfares have also increased the prevalence of chlorides in nonmarine environments. The development of atmospheric monitoring systems and the widespread availability of computers have made possible extensive modeling and correlation studies. All of these developments have made the study of atmospheric corrosion a dynamic and challenging field in spite of eight decades of work.

The symposium that was held 12-14 May 1986 in Philadelphia featured 30 speakers on a wide variety of topics. All the major engineering metals were covered, including weathering and structural steel, stainless steels, zinc galvanized steel, aluminum and copper alloys. Several

other papers on atmospheric effects, corrosion monitoring, clad metals, and computer modeling rounded out the program.

In 1976, the first plenary meeting of the International Organization for Standardization (ISO) Technical Committee 156 in Corrosion of Metals and Alloys met and identified atmospheric corrosion as a priority area for standards development. Two working groups were formed to address aspects of atmospheric corrosion. Working Group 3 (ISO/TC 156/WG3) was concerned with corrosion test methods, while Working Group 4 (ISO/TC 156/WG4) was concerned with classification of atmospheric corrosivity. Working Group 4 is now sponsoring an atmospheric exposure program that is described in this STP.

In view of the wide coverage and international participation in this symposium, this STP provides a cross section of the state of the art in atmospheric corrosion testing in the mid 1980s. Taken with the other ASTM STPs, it provides a comprehensive view of the subject. However, the field is continuing to develop and more symposia will be needed in the future.

References

[1] *Metal Corrosion in the Atmosphere, STP 435,* American Society for Testing and Materials, Philadelphia, 1968.

[2] *Corrosion in Natural Environments, STP 558,* American Society for Testing and Materials, Philadelphia, 1974.

[3] *Atmospheric Factors Affecting the Corrosion of Engineering Metals, STP 646,* S. K. Coburn, Ed., American Society for Testing and Materials, Philadelphia, 1978.

[4] *Atmospheric Corrosion of Metals, STP 767,* S. W. Dean, Jr. and E. C. Rhea, Eds., American Society for Testing and Materials, Philadelphia, 1982.

Sheldon W. Dean

Air Products and Chemicals, Inc., Allentown, PA 18105; symposium cochairman and coeditor.

T. S. Lee

National Association of Corrosion Engineers, Houston, TX 77218; symposium cochairman and coeditor.