pressing my own deep personal feeling and interest in this occasion. Coming to Cornell when the society was only five years old, and accepted as a member, I remained for thirteen years in this atmosphere which has engendered the Society of Sigma Xi and which had sent it on its mission throughout our broad land. The memories of the birth of the society were still fresh in those years. I have known personally three of the founder members of the society, and among them Henry Shaler Williams of blessed memory. From one of the others, Professor C. B. Wing, now emeritus professor of civil engineering at Stanford University, I bring sincere regrets that he can not be present with us on this occasion, together with warm greetings to you all.

For these reasons, from my early acquaintance and association with these pioneers of our society, by reason of my period of thirteen years spent most delightfully in the intellectual, social and physical environment which Cornell affords, the present occasion holds for me a peculiarly keen and special interest.

And so, through the years which have passed since those beginnings, our society has come to the mid point of the century. Of our history during that period, you will, as I have said, hear more in a moment. But in reviewing the past, we must not forget the future. The past has gone beyond recall. The future is still before us. We may draw lessons from our experience of the past; we have the future in which to apply these lessons. Let us, then, while we think of the past, keep our faces toward the future with a firm resolve that, so far as in us may lie, the future of our society shall show an ever rising gradient of progress in the scope and effectiveness of its service to the cause of science and the scientific training of the young.

Again, let me express to you both our profound appreciation for your words of welcome and cheer to us on this occasion.

WILLIAM F. DURAND

STANFORD UNIVERSITY

BRIEF HISTORY OF SIGMA XI

THE Society of the Sigma Xi is a fifty-year old youth movement on a high level and a large scale. It was started on the campus of Cornell University in 1886 by nine young students under the guidance, but not the control, of the justly well-known geologist, Professor Henry Shaler Williams. Its purpose has always been to promote research in pure and applied science. The method followed in the pursuit of its object has always been the encouragement and recognition of excellence of college and university undergraduates and graduates in the pursuit of science courses. It associates into one body all students who exhibit special ability in science, regardless of the field of endeavor. The preamble of the first constitution sets forth this object and this method definitely.

> Friendship in Science. While those whose heart and soul is in their work, are coping with the great problems of Nature, let them remember that the ties of friendship can not be investigated, but only felt. Let them join heart and hand, forming a brotherhood in Science and Engineering; thus promoting and encouraging by those strong, personal attachments of friendship, the highest and the truest advances in the scientific field. To lend aid and encouragement to those newer brothers, who likewise laboring in the same sphere are aspiring to honored positions. And in collegiate halls to award an honor, which to scientific recipients shall signify, "Come up higher."

During the first quarter century of the society's history, branches of Sigma Xi were established in 28 institutions in which science and technology were notably strong, and 300 young men and women of marked accomplishment in science courses were annually elected to membership.

For 25 years the activities of the national organization were a summation of the activities of the 28 individual units. But in 1913 and 1914 it began to appear that the society as a whole was confronted with problems which affected not one chapter, or several chapters, but all chapters alike. A national policy became necessary. The first of these questions was connected with the inevitable expansion of the society. What institutions should be given charters for chapters? A strict definition of conditions was made—president and trustees of an institution contemplating a chapter must be favorably disposed toward research; there must be apparatus and facilities available for research; there must be members of the faculty who have had adequate training for research; there must have been a continuous output of research for a number of years; there must be appropriations for research.

A second national problem arose about this time—what should constitute eligibility for election of young men and women into the society? All students in the institutions where there were chapters had had opportunity to show excellence in science by their scholastic record, but only a very few had had a chance to exhibit an aptitude for scientific research by actual research work. The situation in the universities and colleges themselves made necessary a distinction among candidates for election into the society, and eligibility requirements were strictly defined. Those students were eligible to membership who, as judged by actual scientific investigation, had exhibited an aptitude for research; and those were eligible to associateship who had shown marked excellence in one or more departments of pure and applied science. In both cases it

was always the ability of youth that was recognized and rewarded.

The second quarter century of the society's history has seen further development of national policies as distinct from chapter activities, but the purpose of the organization as originally expressed by the nine young men who started it has never been lost sight of—the promotion of research in pure and applied science. On the contrary, the society as a whole is realizing its object to-day more substantially than at any time in its history. The 28 chapters of 1911 have grown to 68 chapters in 1936. Chapters are no longer limited to the United States. Canadian institutions have been recognized, and inquiries about chapters in England and Europe have been received. Instead of 300 young men and women elected annually into the society, there are now some 1,200. A constituency of 7,500 in 1911 has become nearly 35,000 in 1936. The membership of 1911 was largely limited in residence and work to the United States. Members and associates of Sigma Xi in 1936 are residing and engaging in scientific research in fifty-five different countries of the world.

National policies have expanded. The society realizes the fact that there are youths in institutions where there are no chapters who have shown excellence in one or more scientific courses, and since 1934 has issued to such individuals certificates in commendation of their work. Over two thirds of the society's constituency are either not connected with any educational institution, or if they have such connection, it is with institutions where there are no chapters. This large group are many of them engaged in actual research, and all of them are interested in the promotion of research. Sigma Xi clubs are authorized to organize wherever there is an interested group of members and associates, and since 1921 Sigma Xi members and associates outside educational institutions have been supporting a Sigma Xi Research Fund, which is distributed by the national organization in small grants-in-aid of research to young men and women who are carrying on scientific investigations in institutions of limited resources. The close of fifty years of constantly expanding activity is signalized by the award of two prizes of $1,000 each, not for research accomplished, but to young research workers in recognition and support of research in progress—one award to a worker in the biological sciences and one to a worker in the physical sciences.

Thus throughout its fifty years of life, the Society of the Sigma Xi has recognized and rewarded ability in science on the part of young men and women. It is in that important aspect of its policies—the encouragement of youth—that lies the ground for its prominent position among scientific organizations, the explanation of the influence it exerts on the advancement of science all over the world and the confidence its supporters everywhere express in its brilliant future.

EDWARD ELLERY
UNION COLLEGE

THE INCEPTION OF THE SOCIETY OF THE SIGMA XI

IN an examination of the addresses delivered during this commencement season at the various universities of the country, it appears that the main theme is the outlook upon the future—but to me there has been assigned the task of looking backward, and to neglect being a prophet of the future, for all prophets are on uncertain ground, and to give the salient facts of the past which led to the inception of the idea for the organization of the Society of the Sigma Xi.

The need of a society in colleges to recognize the scientific spirit and acknowledge research was not altogether new fifty years ago. Science in fact was energetically pushing up its head amid the devotees of classical culture, and it was occasionally accentuated by profound scholars that the study of the classics, Greek and Latin, while of a certain cultural value, were not of necessity a mental or even educational training such as best fitted students for a scientific career nor for deep research nor even as a preparation for the activities of life.

As a junior student at the Stevens Institute of Technology, there came to my attention a commencement day address before the Phi Beta Kappa Society at Harvard on June 28, 1883, by Charles Francis Adams, Jr., of Boston, for which he selected the unique title "A College Fetich." This address stirred the classicists from one end of the country to the other, and even had its rebound into England and Germany.

First let us indicate who this Charles Francis Adams, Jr., was. At the time he was president of the Union Pacific Railway—hence spoke as one with authority. He was one of the celebrated family of Adams that had supplied two presidents of the United States—(and in passing we can now say that a recent Adams of the same name was our Secretary of Navy during the Hoover Administration). This Phi Beta Kappa address seriously challenged all claims for the study of the dead languages to have educational value. In fact, he said that this study of the Greek and Latin had been like a millstone about the necks of all the family and all others who aspired to careers in science or even in politics and diplomacy, and such study as feats of memorizing was the correct thing for those who expected to become professors of these languages; but that as working tools of life, a knowledge of French, German and Spanish was far preferable, and that for close and exact mental drill, the higher mathematics, chemistry, biology and electricity were then most essential.