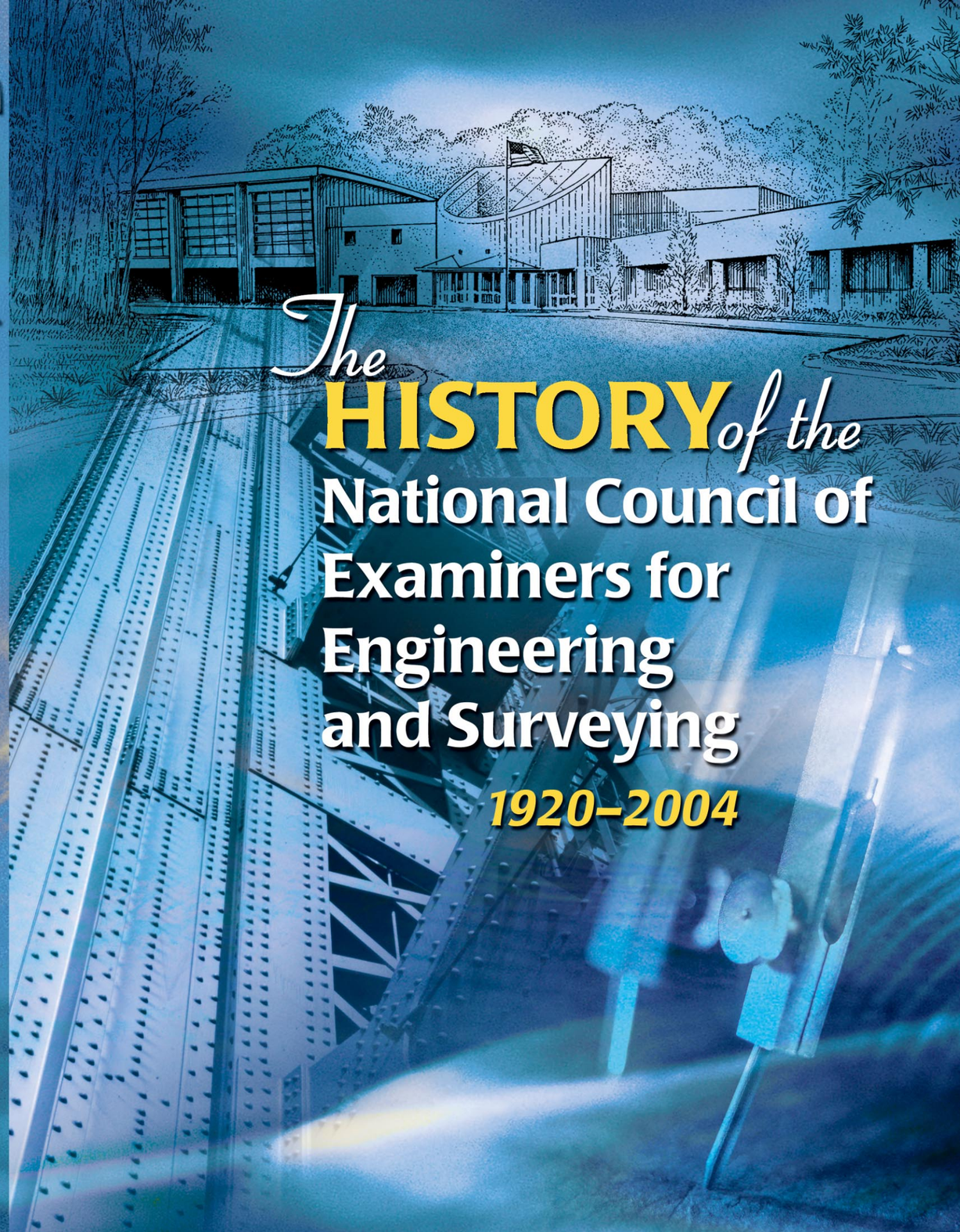
National Council of Examiners for Engineering and Surveying
Clemson, South Carolina 29633
www.ncees.org

The **History** *of the* **National Council of Examiners for Engineering and Surveying** ***1920–2004***



The HISTORY *of the* National Council of Examiners for Engineering and Surveying

1920–2004

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1920–2004

The National Council of Examiners for Engineering and Surveying®,
Clemson, South Carolina 29633
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To T. E. Stivers, P.E.

Of the many individuals who could appropriately be selected for the dedication of the third edition of *The History of NCEES*, none is more deserving than T. E. Stivers, P.E. Among the noteworthy contributions he has made in more than 30 years of service to the Council are a term as President of the Board of Directors in 1976–1977 and service as a member, chair, or consultant on numerous NCEES committees. During his long association with the Council, Stivers has attended 33 Annual Meetings and 29 zone meetings. In recognition of his service to the Council, Stivers was awarded the Distinguished Service Award in 1980 and the Distinguished Service Award with Special Commendation in 1989. He was involved in the development of the Participating Organizations Liaison Committee (POLC), and at the time of this writing, he serves as a member of the Committee on Awards.

Stivers was a member of the Georgia State Board of Registration for Professional Engineers and Land Surveyors from 1970 to 1980 and has served as an emeritus member for the past 23 years. He is a past president and national director of the Consulting Engineers Council of Georgia and served on numerous committees of the American Consulting Engineers Council, including four years as a member and two years as chair of the Registration Committee.

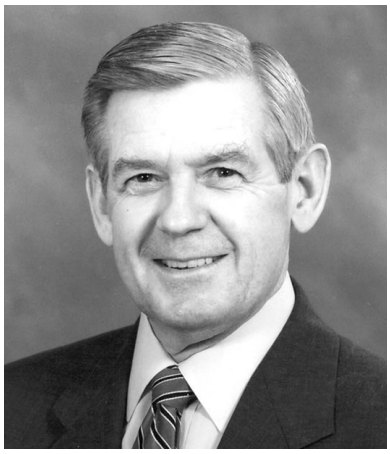
Stivers began his career in his family's flour mill. After gaining a baccalaureate degree in milling technology from Kansas State College, he was employed by the Quaker Oats Company prior to World War II. He served four years as an engineering officer in the U.S. Navy, including duty at repair facilities, some postgraduate work in mechanical engineering, and two years of sea duty. After the war, he returned to Quaker Oats, becoming manager of Milling Research. He resigned in 1953 to found the first of three companies specializing in mill design and grain processing. These later formed the T. E. Stivers Organization, Inc., Consulting Engineers, which he sold in 1985.

He was the first agricultural engineer member of NCEES and represented the American Society of Agricultural Engineers (ASAE) for four years on the POLC. In 1982, ASAE awarded him the prestigious Cyrus Hall McCormick Medal for Exceptional and Meritorious Engineering Achievement in Agriculture.

Stivers is pictured above with his wife, Mary, his constant partner in his NCEES activities.

NCEES 2004
Third Edition

To Roger B. Stricklin, Jr.



This edition of *The History of NCEES* is dedicated to Roger B. Stricklin, Jr., in recognition of his tireless efforts and significant achievements during nearly 18 years of service with the Council.

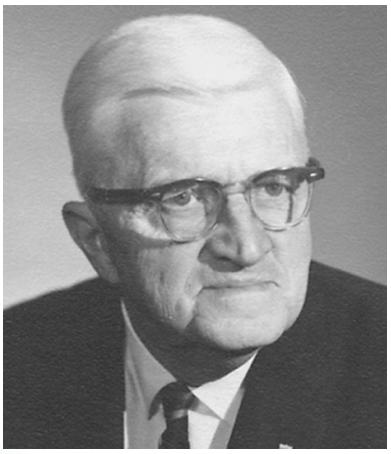
Stricklin joined the NCEES staff as an Administrative Assistant in September 1977 after a 25-year military career during which he received numerous awards and citations for his service in areas that included Germany, Korea, and Vietnam.

Stricklin was named Acting Executive Director in January 1982 and was appointed Executive Director in August 1983. During his tenure as Executive Director, all activities of the Council experienced significant growth. He oversaw the expansion of the office facility to some 25,000 square feet in June 1990 and guided the Council through such technological modernizations as the installation of a local area network and development of the online Law Enforcement Reporting System. In addition, the Council began assuming responsibility for work previously performed by contractors and consultants during Stricklin's tenure.

Stricklin served as Secretary-General of the United States Council for International Engineering Practice (USCIEP), a tripartite organization formed to negotiate agreements with other international engineering organizations. During his stewardship, a Mutual Recognition Document was signed by representatives of Canada, Mexico, and the United States of America. This document is recognized as a crucial element in the success of the engineering services section of the North American Free Trade Agreement (NAFTA). In addition, Stricklin served as staff liaison to several committees and often participated in activities of other national engineering organizations.

Upon his retirement, the Maine Board of Registration for Professional Engineers bestowed an honorary lifetime membership, and the Pennsylvania Registration Board for Professional Engineers, Land Surveyors, and Geologists bestowed the title of honorary Professional Engineer. Retired from the Council since September 1, 1995, Stricklin resides with his wife Joyce in Clemson, South Carolina.

NCEES 1996
Second Edition



To Oliver B. Curtis, Sr.

P.E., L.S. 1903–1988

Oliver B. Curtis, Sr., P.E., L.S., of Jackson, Mississippi, was a powerful force in the affairs of the National Council of Engineering Examiners for 48 years. His stellar contributions to the profession are revealed in his NCEE activities. He participated in 73 of 75 zone meetings, 38 of 42 Annual Meetings of the NCEE, and chaired more national committees than any other individual. In recognition of this service, he was awarded the first Distinguished Service Certificate of the Southern Zone, the first Distinguished Service Award with Special Commendation, and the first Presidential Award. Curtis served as president of the Board of Directors of NCEE in 1960–1961.

He served 35 years on the Mississippi State Board of Registration for Professional Engineers and Land Surveyors, commencing in 1949, as a board member and board secretary. In 1975, the board executed a contract with Curtis to serve as an adjunct consultant to the board and its staff.

Curtis earned a bachelor of science degree in civil engineering from Mississippi Agricultural and Mechanical College (now Mississippi State University). He worked, until retirement at age 70, in the civil engineering field. He was a member of Tau Beta Pi honorary engineering fraternity.

His first love was the Council, especially in the area of international professional engineering registration procedures. He served for a number of years as chairman of the Council's Committee on Foreign Education. As such, he wrote a series of reports on engineering education in other countries.

In 1981, Curtis was appropriately recognized with the presentation of the Council's Presidential Award for his long years of service. Subsequently, at the request of President A. T. Kersich, he agreed to undertake the job of writing the history of the Council.

NCEES 1988
First Edition

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Foreword to Third Edition

The first edition of the Council's history was published in 1988, sixty-eight years after the Council was formed. A second edition was published in 1996, and now, only eight years later, a third edition is warranted. I believe the frequency with which the Council's history requires updating provides ample testimony to the increased volume of work undertaken by the Council on behalf of the Member Boards.

This new edition of *The History of NCEES* has been published in the same year that saw the dedication of a large new addition to the Council's headquarters in Clemson, SC. Perhaps the timing of these two events is coincidental, but I see it as further proof that the Council is a growing and thriving organization. At this writing, the Council staff has grown to approximately 60, more than double the number from a decade ago, and, two expansions later, the headquarters occupies nearly 38,000 square feet, more than triple the size of the building that first occupied the current location.

This is indeed an exciting time for the Council. Particular effort has been directed to modernizing and expanding NCEES's technological infrastructure to improve the Council's ability to communicate with and serve all segments of the engineering and surveying communities. In less than five years, our exam administration service, ELSES, has grown from a fledgling pilot program in a single state to an established, trusted service administering our exams in 25 states, with several other states scheduled to join over the next few exam administrations. ELSES provides the Member Boards with assurance that the licensing exams are administered uniformly and with increased security. Another important development, with security and cost-effectiveness in mind, is the decision to bring in-house the development, scoring, and reporting of the Fundamentals of Engineering exam.

All told, I believe President Fisk was correct in the foreword to the second edition when he wrote that the NCEES has set the standard for finely honed licensure laws in the past and that it will continue to do so in the future.

F. Elizabeth "Betsy" Browne
Executive Director

Foreword to Second Edition

The precursor to the National Council of Examiners for Engineering and Surveying began in 1920 as a seven-member group whose primary goal was to promote reciprocity and comity in allowing qualified engineers and surveyors to practice across state lines while protecting the public's health, safety, and welfare. Seventy-five years later, the organization includes 70 Member Boards, representing all U.S. states and territories, and yet the challenge remains the same: identifying those qualified to practice engineering and surveying in such a way that the public welfare is protected.

The Council has undergone several name changes in the past 75 years to reflect its changing vision. The first Council in 1920 was the Council of State Boards of Engineering Examiners. In 1931, National was added to that name. In 1967, the named was changed to the National Council of Engineering Examiners. Most recently, in 1989, the name was changed to the National Council of Examiners for Engineering and Surveying to recognize the fact that members are involved in the regulation of both engineering and surveying.

When O. B. Curtis, Sr., undertook the massive task more than 10 years ago to write the first edition of *The History of the National Council of Engineering Examiners*, he laid out as his intention to "furnish a chronological record of the formation, development, principal accomplishments, and innovative actions of the NCEE; and to record the procedures and methods by which these actions were accomplished all in an effort to enhance the historic value and the use of the book."

This edition picks up in 1984, where Curtis left off. The scope of the NCEES has grown exponentially in the past decade, and today the Council stands on the brink of worldwide leadership in international licensure. At the same time, the Council continues to focus on its first priority: examinations that assure competency. The examinations themselves have continued to evolve as technology changes. Many new disciplines have been added, formats have changed to reflect more appropriate and rigorous assessment, and methods of scoring have been updated to both improve the quality of the assessment and reduce the costs associated with scoring.

With monumental technological advances such as space travel, nuclear innovations, and worldwide computer networking, the need for finely honed licensure laws across a multinational organization will continue to become more critical to the protection of the public welfare. The NCEES has set the standard in the past, and all indications are that it will continue to do so in the future.

Warren L. Fisk, P.E., L.S.
NCEES President 1995–1996

Foreword to First Edition

The National Council of Engineering Examiners (NCEE) is a council of Engineering Examining/Registration Boards which has grown from a loosely knit, seven-member group to a well-organized council of 59 regulatory Member Boards plus seven Affiliate Member Boards in a period of time spanning less than seven decades. Throughout the years, its objective has remained remarkably clear: to assist its Member Boards in their duty to protect the public's health, safety, and welfare.

Member Boards are delegated with the authority to and are charged with the responsibility of administering the provisions of the laws of their respective states/territories/jurisdictions, which is an exercise of the police powers reserved to the states by the U.S. Constitution. A majority of the Boards now administer the provisions of laws governing more than one profession, e.g., engineering and land surveying; engineering, architecture, and landscape architecture, etc. Some states have separate Boards for each profession. Governors appoint engineer/land surveyor members to serve on the Boards, usually from a short list of nominees furnished by the representative professional society/societies in their respective states.

The need for an organization such as the Council became acute by 1920 after several states enacted laws requiring registration of engineers offering or performing professional services within their respective states. Engineering then, as now, is a very mobile profession with a substantial percentage of practitioners practicing in more than one state. Well-established, competent, ethical engineers whose clients wanted them to design, prepare specifications, and furnish engineering supervision of construction were frequently embarrassed to find that delays of several months might occur before they could obtain registration in a neighboring state in which they had formerly practiced. Engineering societies, each of which had supported the enactment of registration laws, decided that the time had arrived when a national organization should be formed whose primary objective would be to promote reciprocity/comity allowing the qualified engineers to cross state boundaries. Through the efforts of engineering societies, working with members of Registration Boards, the Council was brought into existence in 1920.

Achieving uniformity in every area of content and administration of the several laws, regulations, and policies was essential to the success of reciprocity/comity. In its early years the Council adopted a reciprocity card which apparently solved the problem for a few years. A Member Board could issue the card to one of its resident registrants, which would enable him/her to obtain registration on the basis of reciprocity in any other state. Many, many flaws were found in this procedure, attributable primarily to unequal provisions in the statutes, unequal administration and/or difficulty of examinations, unequal interpretations of experience, unequal qualifications of "grandfather" registrants, etc. The reciprocity cards provided a much-needed solution in quite a few situations; however, the damage caused by a flow of incompetent practitioners into the industrial states whose standards of quality had not yet reached an advanced stage resulted in the discontinuance of this effort.

The quest for uniformity was accelerated. Successive editions of a Model Law were developed, although the time cycle for enactment in a majority of the states extended to more than a decade.

Exchanging information on examination content, discussing enforcement experiences, circulating court decisions, etc., all contributed to uniformity that resulted in more registration by reciprocity.

The contribution of the writer to this history of NCEE was developed by reading through more than 15,000 pages of the official proceedings of the annual meetings and noting the significant actions. Additionally, knowledge gained from personal participation in the Council's activities has been injected. NCEE's Ad Hoc Committee on Council History has contributed meaningful input into the development of the book.

The intention has been to furnish a chronological record of the formation, development, principal accomplishments, and innovative actions of NCEE and to record the procedures and methods by which these actions were accomplished all in an effort to enhance the historic value and the use of the book.

Forty-three hours of dictating on tapes extended over a period of more than two years. Tapes were mailed to Executive Director Roger B. Stricklin, Jr., three or four at a time. NCEE's staff transcribed the tapes (813 pages, double spaced). Following an editing job on approximately 15 percent of the transcriptions by a heavily burdened university professor, NCEE's officers entered into a contract with Ms. Patricia Morton Gergel of Columbia, South Carolina, (the editor of the book) to convert the many typed pages of transcription of an oral assignment into a writing suitable for publication. Ms. Gergel accepted a tremendous assignment, working against a reasonably brief timetable. We were both assisted by the knowledge and efforts of Mary M. Law, Agency Director of the South Carolina Board and former secretary to T. Keith Legaré.

The principal values of the two time periods extending through World War II are to record the events which generate the need for a national body of regulatory engineering boards, to identify the nature and complexity of the problems involved in resolving problems and issues, and to emphasize the dedication and conscientiousness of the earlier members, all in the hope and belief that their cost-free labors will serve to inspire present and future members of Member Boards.

The time periods following World War II have multiple potential values. First the principal values noted in the previous two time periods are applicable to later periods. Additionally the growth in size of NCEE, the very sizeable growth in the number of registrants, the mobility of practitioners, the development and later validation of national uniform examinations, and the ever-increasing enforcement activities all created new problems to solve. Recording the innovative actions should prove useful to new members.

A positive trend has developed whereby the age of newly appointed Board Members has increased and the length of service has decreased. These older engineers are not novices. Usually they have multiple decades of experience and of knowledge of registration procedures. This Council History can and should serve as a ready reference to the concerns and accomplishments during the most recent years, in whatever area or areas of activity a new member prefers to make a contribution of time and talent.

A valuable byproduct of the Council History is to inform interested members of the public that there has been and is a body of engineering professionals who have given and are giving freely of their time and talent to administer the laws of the several states to safeguard the health, safety, and welfare of the public.

If this Council History can serve to accomplish all or a substantial part of the values as intended, then the author will have made one last contribution in the twilight of a six-decade professional career.

"SCRIBIMUS INDOCTI DOCTIQUE"

Oliver B. Curtis, Sr., P.E., L.S.

About the Authors

O. B. Curtis, Sr., P.E., L.S., authored the first edition of the NCEES History, covering the years 1920 to 1988. Curtis served the Mississippi State Board of Registration for Professional Engineers for more than 45 years, serving as a member-secretary for 33 years and as consultant to the board for 12 years. During his tenure with the Council, he served on numerous committees, and in 1960–1961 he served as Council President. He was the Council's most decorated member—receiving the Distinguished Service Award in 1957, the Distinguished Service Award with Special Commendation in 1974, and in 1981, he became the first receipient of the President's Award. Curtis' contributions to improved international relations and uniform evaluation of education attained in foreign countries will long be remembered by his fellow members of the Council. This history of the Council is a testament to his dedication to the engineering and land surveying professions and to the objectives of the Council to promote the protection of the public health, safety, and welfare and property by upholding the highest standards of the professions.

David L. Curtis, P.E., author of Task Forces Address Impediments to Licensure Mobility, which explains the problem of interstate comity and the efforts the Council has made to alleviate it, is the executive director of the Idaho Board of Professional Engineers and Professional Land Surveyors. He chaired the Mobility Task Force from 1999 to 2001 and the Individual and Business Comity Task Force in 2001–2002.

Frank Loudon, P.E., author of Council Changes Format of PE Examinations, was intimately involved in the transition of the PE exam to the breadth/depth format, and in this section, he explains the steps the Council took leading up to the change. Loudon began his extensive work with the NCEES Electrical and Computer exam committee in 1990. He was a member of the Committee on Examinations for Professional Engineers from 1994 to 1997 and chaired the committee from 1997 to 1999. In addition, he chaired the Committee on Examination Policy and Procedures from 2000 to 2002.

Walt LeFevre, Ph.D., P.E., authored FE Examination and Its Use for Outcomes Assessment, which summarizes the development of the FE exam as an outcomes assessment tool. LeFevre was chair of the Committee on Examination Policy and Procedures from 1987 to 1989, has served on numerous other NCEES committees, and currently serves on the Education/Accreditation Task Force. LeFevre served 12 years on the Arkansas State Board of Engineers and is now an emeritus member.

Rita Lumos, L.S., author of *Model Law* for Surveying Revised, which outlines the developments of the *Model Law* for surveying from 1994 to 2003, has been a key stakeholder in the surveying community and in the modifications to the *Model Law* for surveying. In addition to her participation in NCEES, she has served on the boards of the National Society of Professional Surveyors and the American Congress on Surveying and Mapping. She served on the 1995 Committee on Uniform Procedures and Legislative Guidelines, the committee that presented the initial changes to the *Model Law* for surveying, and chaired the committee in 1996. Lumos began serving on the Committee on Examinations for Professional Surveyors (EPS) in 1996 and has continued to participate since then. She was chair of the EPS Committee in 2003–2004 and was a member of the Task Force on Model Law for Surveying in 2001–2002.

Jon Nelson, P.E., author of ELQTF Studies Engineering Licensure Process, which describes the work of the Engineering Licensure Qualifications Task Force from 2000 to 2003, was chair of the task force and continues to serve as the Board liaison to its successor, the Licensure Qualifications Oversight Group. Nelson has also served on several other NCEES committees. He is a member and past chair of the Oklahoma State Board of Registration for Professional Engineers and Land Surveyors and served as the NCEES Southern Zone Vice President from 2001 to 2003 and as NCEES President-Elect in 2003–2004.

Patricia Gail Oliver, L.S., P.S.M., author of Council Supports Digital Signature Technology, chaired the Electronic Technology Task Force from 1998 to 2000 and in this section describes its recommendations, incorporated by the Council into its *Model Law*. Oliver served as chair and vice chair of the Florida Board of Professional Surveyors and Mappers and is now an emeritus member of the board. She has been a member of NCEES since 1984 and has served on several other NCEES committees, including her current membership on the Committee on Uniform Procedures and Legislative Guidelines.

In addition to the authors listed, numerous volunteers and Council staff contributed to the research, writing, and editing of this book and are to be commended for their part in recording the NCEES history.

Special thanks go to Past Presidents Andrew Liston, Steve Schenk, and Skip Lewis, former Treasurer Elaine Fink, and Delaware PE Board member Bob McClure for their help in identifying the topics and issues most important in the last decade.

Introduction

In some European countries, the governments entitle the engineering profession with control of its entrance requirements and rights to practice. In the United States, however, the legislative branch of the government holds this regulatory power, which resides not with the federal government but with individual states. The Tenth Amendment to the U.S. Constitution grants to the states all powers not accorded to the central government nor explicitly denied them. These powers include the right to legal jurisdiction over their sovereign territories, including the right to regulate professions. Every state in the union as well as legal territories therefore have laws controlling and regulating engineers practicing under their jurisdiction.

This government control grows from the nature of our laws. The enabling statements justifying professional licensing boards refer to "their responsibilities in regulating the practice of engineering and land surveying as it relates to the welfare of the public in safeguarding life, health and property." The state legislatures in effect turn over to the boards the right to control the professions of engineering or land surveying and empower the boards to collect fees to support the registration process. The public interest is further protected by allowing only registrants to identify themselves as engineers or land surveyors. Although the boards function as agencies of the state, they maintain an association with the major engineering societies. Some tension develops here because the states must maintain control of the boards to ensure their protection of the public interest and to see that the societies do not exert undue influence on the boards.

Because each state with its own board registers engineers within its own boundaries, problems developed in the history of registration for those who wished to practice in more than one state. By the beginning of this century, many kinds of engineering had ceased being a regional endeavor. As the west opened up and efficient transportation systems developed, engineers found it necessary to become registered in several states. Engineers employed by railroads, for instance, because of the interstate nature of their duties, needed to be registered in several states at the same time.

To become registered, however, was a time-consuming process. Engineers had to report to every board and meet the specific requirements for each state. Because the states all had laws that developed to meet particular and often idiosyncratic needs, these laws were quite different from one another. It became clear to many in the profession that some national body was needed to coordinate the various state boards. In 1920, a small group of forward-looking representatives from seven state boards met to found what today is known as the National Council of Examiners for Engineering and Surveying (NCEES).

The history of this organization falls into six stages. During the first stage, which lasted approximately five years, from 1920 to 1925, the small number of boards sending representatives got acquainted with each other. Because they were few in number, these representatives functioned as a committee that discussed common problems and possible solutions. Their goal, of course, was to provide for reciprocity among licensed engineers by means of interstate registration.

The second era of the Council began in 1926 and lasted to the end of World War II. Although little development occurred during the war years, the early part of this era was marked by important

results: the expansion of the number of state boards and membership in the Council, the putting into practice the provisions of the model laws, the working out of differences among states in order to move toward uniformity and establish reciprocity, and the first lawsuits that tested the new laws.

The third era continued from 1946 to 1959. Although the American Society of Civil Engineers had developed earlier model laws to help make the various state laws more consistent, the Council in 1946 adopted its own Model Law. This law corrected some of the definitions in earlier laws and took into consideration the various decrees and opinions handed down by the courts. During this era the Council initiated the Engineer-in-Training classification, which grew out of circumstances in World War II. Young unregistered engineers working in the war camps and training camps were often forced to join labor unions because they were not considered professionals. New York was the first state to establish the Engineer-in-Training classification that allowed the young engineering graduates to take eight hours of their engineering fundamentals exam and begin the process of moving toward professional status. During this era, almost every state established such a classification, and it proved so useful that even though the original need for it passed, states decided to continue using it to give the young graduate a professional identification.

During this period, when the engineering profession divided itself into areas of specialization and responsibility, the Council's primary responsibility was developing the Model Law. It did this with the advice of the numerous engineering societies who all contributed to its development. This was a long, tedious process since each society had its own interests that it wanted expressed in the law. The Council in effect became the custodian of the law for the engineering profession.

The fourth era, from 1960 to the end of 1983, was marked by developments in the national examination, in the methods of enforcing the registration laws, and in improving reciprocity. Because the profession had become highly mobile, many states had more out-of-state than in-state registrants, making reciprocity even more important. Therefore, much was done to standardize the actions of state boards and to develop further the national examination for registration applicants.

In the fifth era, from 1984 to 1995, the Council's activities centered around professional ethics, exams, and international engineering issues, with the evolution of the Council's position on professional responsibility and the strengthening of the rules of professional conduct, particularly where the seal and whistle-blowing were concerned, perhaps being the Council's greatest achievement in this decade.

The years between 1984 and 1995 also saw the continuing evolution of the licensing exams, with the major developments being a shift from a norm-referenced method to a criterion-referenced method and the determination that all Principles and Practice of Engineering (PE) exams were considered to be psychometrically sound.

The sixth era, the years from 1996 to 2004, could be called a turning point in the Council's history. The engineering and surveying professions had greatly evolved over the last several decades, and NCEES leaders recognized the enormous changes occurring in the professions and those coming in the future. The Council realized it needed to examine, and even reshape, its fundamental precepts to remain vital and useful to its Member Boards and professions.

Change resulted in a variety of positive outcomes. By 1995, the NCEES budget was $5 million, and in 2003 the budget exceeded $9 million. In 1995, NCEES exams were half essay and half multiple choice with widely fluctuating pass rates, though exam committees worked diligently to stabilize them. In 2001, all exams were 100 percent multiple choice, three exams were administered in the breadth/depth format, and pass rates had stabilized. In 1995, the Council's principal revenue

stream was exams, limiting the services the Council was able to provide. By 2001, in addition to exams, the Council's Records Program was a major revenue source, as was the new NCEES exam administration service, Engineering and Land Surveying Examination Services, now called ELSES, LLC. Both provide needed services to engineers, surveyors, and Member Boards, while also allowing the Council to continue to seek additional means of service.

In 1995, Roger B. Stricklin, Jr., who served as NCEES Executive Director for 18 years, retired amid well wishes and expressions of gratitude for a job well done. The NCEES Board appointed Betsy Browne Executive Director, and she began to work immediately to prepare the Council for the future and assist the Board in enhancing NCEES services and broadening the Council's scope of influence.

In addition to the developments above, the Council participated in a variety of policy discussions between 1996 and 2004, many of which resulted in modifying the administration, focus, and direction of the Council. One impetus for such discussion was the downturn in the 1990s of the number of engineers seeking licensure. "This resulted initially in serious budget issues driving a closer look at how the Council conducts its business," says Past President (1997–1998) Steven Schenk, P.E. He continues, "Recognizing that fewer and fewer graduating engineers seek licensure also initiated serious consideration of licensure promotion and of addressing the relevancy of our licensing system, efforts that are currently ongoing." These issues and others, including the definition of the practice of land surveying, licensure mobility, use of the Fundamentals of Engineering exam for outcomes assessment, and review of the engineering licensure process, were all important during this time and played significant roles in forming the updated Strategic Plan. Each issue was brought before the Council body at more than one Annual Meeting, illustrating Schenk's comment, "Little occurs within the Council on a one-year time line."

Though the Council underwent many changes during this period, one thing stayed the same: NCEES continued to focus on developing high-quality licensing exams for engineers and surveyors. Past President (2002–2003) Robert Krebs, P.E., L.S., commented in a February 2003 *Licensure Exchange* article, "In my opinion, what we do is less about the methods of surveying or the various new disciplines of engineering and more about developing quality exams and assisting Member Boards in their mission to protect the public." Quality exam development has included the introduction of an academic-based Fundamentals of Land Surveying (FLS) exam, the transition of all PE exams to the multiple-choice format, and the move of three PE disciplines to the breadth/depth format.

Throughout its six eras, NCEES has maintained a unique position in the engineering and surveying professions. It has profoundly affected the practice of engineering and surveying in this country because of its work in developing the *Model Law*, accrediting engineering schools, administering the national examination, working toward reciprocity, and performing all its other functions.

It is the purpose of this book to trace the Council's development over a period of more than eight decades from a group of 15 members of various boards trying to develop a system of reciprocity to a complex organization that efficiently performs a multitude of functions for the Member Boards to assist them in their duty to protect the public interest.

Flag raising at headquarters dedication, December 12, 1981, shown left to right: Past President Frederick H. Rogers, Sr., Mrs. James H. Sams (wife of former Executive Director James H. Sams), Past President Alfred H. Samborn, Past President O. B. Curtis, Sr., Past President Herman A. Moench, Mrs. Mary M. Law, Agency Director of the South Carolina Board, and Past President William J. Hanna.

Past Presidents at dedication of headquarters on December 12, 1981, shown seated from left to right: Anthony L. Bavone, 1971–1972; Morton S. Fine, 1974–1975; O. B. Curtis, Sr., 1960–1961; Orland C. Mayer, 1973–1974; Chester A. Arents, 1970–1971; Frederick H. Rogers, Sr., 1978–1979; and standing, from left to right: Donald E. Marlowe, 1966–1967; Herman A. Moench, 1975–1976; William J. Hanna, 1977–1978; Eugene N. Bechamps, 1980–1981; Alfred H. Samborn, 1979–1980; T. E. Stivers, 1976–1977; and Albert T. Kersich, 1981–1982.

CHAPTER 1
The Foundation Laid
1920–1925

Wyoming was the first state to exercise the Constitutional power to regulate the engineering profession. In 1903, 31-year-old Clarence T. Johnston had accepted the position of State Engineer. He found the office in poor condition, the main problem being the fact that untrained individuals were working as engineers and land surveyors. A state law mandated that all people who wished to use state water to irrigate land had to file an application for a permit. The law also required that a map be filed to outline streams, canals, and reservoirs, as well as the lands to be irrigated. As Johnston wrote in a letter years later, he "discovered that lawyers, notaries, and others were making the maps and signing them as engineers or surveyors," and this practice led to confusing and inaccurate records. With the help of some colleagues, Johnston prepared a bill designed to remedy this problem. Although it met with much resistance from those benefiting from the lack of regulation, "the Wyoming legislature passed the bill. After it took effect, Johnston wryly commented, "A most astonishing change took place within a few months in the character of maps and plans filed with the applications for permits."

Johnston served as the Secretary of the Wyoming Board of Engineering Examiners until 1911, when he accepted a position on the staff of the University of Michigan's College of Engineering.

Soon recognizing the benefits of such regulation, other states passed similar laws. In 1908, one year after the Wyoming law, Louisiana passed legislation, and in 1915, Illinois began regulating structural engineers. That same year Florida joined the regulated group. Oregon, Nevada, Michigan, Iowa, Idaho, and Colorado passed laws in 1919, and the following year saw New York and Virginia pass theirs. In 1920, the year the Council was founded, eight more states framed laws. Between 1921 and 1947, all states passed registration laws for engineers, and by 1970, all 50 states and the five legal jurisdictions of the United States had laws regulating in some way the practice of engineering.

Because each state developed its own engineering registration law, individuals active on the State Boards of regulation in the various states soon recognized the need for some central body to coordinate their individual efforts. As the matter stood before 1920, engineers had to be registered in each state in order to operate within its jurisdiction because the individual State Boards did not recognize each other's licenses. This situation caused much confusion, especially since the standards for registration varied from state to state. Clearly a national body was needed to work toward some sort of professional standards and reciprocal recognition.

Thus it was in 1920 that the Iowa State Board of Engineering Examiners issued a call to the 10 State Engineering Boards then in existence to send representatives to a meeting. The call read:

> It having developed, in the application of the laws for the registration of Professional Engineers, Land Surveyors and Architects, that there should be an organized and systemized method of procedure to be followed in interstate registration, that there should be a uniform basis of examination and registration, that a convention for the

> purpose of arriving at a working plan and an understanding of the scope, plan, and procedure of the several Boards was desirable and practical. Further, that it appeared to be desirable to effect a form of permanent organization to arrive at the best understanding and to facilitate the business of state and interstate registration.

This invitation, though short, refers to several of the major concerns of the Council through the years. First, it calls attention to the need for reciprocity among State Boards. Second, it mentions the need for a uniform examination and for cooperation among the State Boards. Third, it points to the need for a permanent, national body to accomplish these goals. Perhaps most importantly, the invitation provided a forum for representatives to discuss mutual problems for the first time.

In response to Iowa's invitation, seven of the 10 existing State Boards sent representatives to the meeting in Chicago's Hotel Sherman on November 8, 1920. The following is a list of the representatives, their resident states, and their positions on their State Boards:

Colorado:	R. G. Hosea, Assistant Secretary
Michigan:	John J. Cox, Secretary; C. T. Olmsted, Office Manager
Iowa:	F. W. Stubbs, Chairman; L. M. Martin, Vice-Chairman; K. C. Kastberg, Secretary; Seth Dean
Florida:	C. S. Hammatt
South Dakota:	John Berg, State Engineer
Louisiana:	Marcel Garsaud, Secretary
Illinois:	F. C. Dodds, Superintendent of Registration; I. F. Stern, Board of Structural Engineering Examiners; Andrew Allens, Board of Structural Engineering Examiners; T. L. Condron, Board of Structural Engineering Examiners; F. C. H. Arentz, Board of Structural Engineering Examiners

In addition to these official delegates, several representatives from other organizations attended: W. W. DeBerard of *Engineering News Record*, C. B. Smith of *Professional Engineer*, and C. E. Drayer, secretary of the American Association of Engineers. Although Idaho, New York, Oregon, Virginia, and Wyoming had boards, they did not send representatives.

Framing the Constitution

For the first order of business, the delegates formed a temporary organization to carry out the business of drafting a constitution and electing permanent officers. Seth Dean accepted the chairmanship, and K. C. Kastberg became secretary. Dean appointed a committee composed of C. S. Hammatt, Marcel Garsaud, and I. F. Stern to write and submit the following morning a constitution and bylaws "for the organization and operation of a Council of Boards of Engineering Examiners."

Given the brief time in which to write, the committee framed an impressive Constitution composed of seven sections and a preamble. This document legally constituted the Council as a "permanent organization…to carry out as far as may be practical, a uniformity of practice in examination and registration of engineers." As for membership, each of the seven State Boards and any other states that had or would have such boards could send one member to the Council's Annual Meeting on the first Monday of October. The committee also established three officers: a president,

a vice-president, and a secretary-treasurer. To cover expenses, the State Boards had to pay the cost of sending members to the meeting and also pay an equal share of incidental expenses the Council incurred. A quorum consisted of five states' representatives, and two-thirds of the voting members could change or amend the Constitution. The Constitution also expressed the purpose of the Council, which was to:

> Examine the State laws providing for registration of engineers and the custom and rule of procedure of the different boards in the examination of applicants with suggestions and recommendations for uniformity of practice so far as the same can legally be done by the different State Boards, and to provide for reciprocal relations between the State Boards for granting registration licenses to applicants from other states on equal terms of examination. (Section 4)

On the first day of the meeting, the delegates discussed various laws enacted in their states to register engineers. Although they discovered many differences among these statutes, they also found that some states already had or were about to add a reciprocity clause. Only Louisiana's law had a provision that allowed engineers in good standing with other State Boards to practice under its jurisdiction. Colorado had no such provision but planned to frame an amendment to that effect in the future. On the second day of the meeting, the following motion, proposed by Condron, carried.

> That it is the sense of this Council that the submission of the evidence of qualification of the applicant for the practice of professional engineering should be considered as the essential part of the examination and that reciprocal registration certificates should be granted to the applicant who has submitted such satisfactory evidence to the examining board of his own state.

This motion left unanswered several important questions, such as the nature of the examination and the problem of the lack of uniformity between state laws, but it did serve as a first step toward national reciprocity.

As for the latter problem, the delegates broached the subject of a model law that could serve as the basis of uniformity for the laws of the various states. On October 31, 1920, the Engineering Council had formulated the "Uniform Registration Law," which Condron introduced for discussion on the first day of the meeting. The representatives carefully perused it and noted proposed changes. On the second day of the meeting, Condron again raised the issue, and Drayer, of the American Association of Engineers, joined the discussion. Although no action came from this discussion, the subject of a Model Law was at least introduced as a matter of concern.

At the end of the first day, the delegates elected the Council's first permanent officers for the coming year. Marcel Garsaud became President, C. S. Hammatt, Vice-President, and Alvin LeVan, Secretary-Treasurer. When the convention adjourned, its representatives, as they traveled back to their respective states, could look with pride at their accomplishments. They had passed motions allowing for development of reciprocity between states, they had framed a Constitution and Bylaws, and they had introduced the subject of a Model Law.

When President Garsaud called to order the second Annual Meeting on October 3, 1921, at the Hotel Statler in St. Louis, he must have felt at least some disappointment. Only eight states sent representatives—Colorado, Florida, Indiana, Iowa, Louisiana, Minnesota, North Carolina, and

Oregon; and three of the founding members—Illinois, Michigan, and South Dakota (which licensed only land surveyors)—did not send delegates. It had not been an easy year for the Council. In his report to the officers and members, Secretary LeVan reports that although Arizona, Indiana, Minnesota, North Carolina, New Jersey, Tennessee, and West Virginia all enacted laws during the winter of 1920–21, he had difficulty finding out from these newly constituted boards the names of their members and had learned nothing from West Virginia and New Jersey at the time of his report. Furthermore, of the 19 states having engineering license laws, only 10 belonged to the Council.

Clearly, much work lay ahead.

Reciprocal Registration Committee Appointed

The main order of business of the 1921 meeting concerned the question of reciprocal registration between states. At the previous annual meeting, the Council had approved a temporary agreement permitting engineers to receive reciprocal registration by presenting "satisfactory evidence of qualification to the applicant's own board." Since this was only a temporary measure, the representatives turned their energies toward establishing a more permanent regulation. After much debate and several unsuccessful motions, the delegates agreed that President Garsaud should appoint a committee of three who would

> …examine the state laws providing for the registration of engineers and the custom and rule of procedure of the different boards in the examination of applicants and to make suggestions and recommendations for uniformity of practice so far as the same can legally be done by the different state boards for granting registration licenses to applicants from other states on equal terms of examination.

This committee was directed to meet before March 1, 1922, and submit copies of its minutes and all reports and recommendations to the Council's Secretary, who would distribute them among the State Boards. The committee consisted of Hammatt, the new President of the Council for the coming year; Garsaud, the retiring President; and R. G. Hosea, the new Secretary-Treasurer.

The only other important item of business at the 1921 meeting concerned the Model Law. William Rolfe appeared before the Council to explain changes made in the Engineering Council's Uniform License Law at the September 1921 meeting of a committee of the Federated American Engineering Societies (FAES). The only action taken required that the Council's secretary write the executive secretary of the FAES in Washington to secure copies of the amended uniform license law for members of the Council.

As would be expected, discussion of the committee's report took up the entire 1922 meeting. The debate progressed at a lively pace among delegates from 15 states as they carefully examined and amended the committee's 12 major points of the Articles of Agreement of Reciprocal Registration of Engineers. By the end of the two-day meeting, the 12 articles had been reduced to 10.

In his September 29, 1923, report to the Council, Secretary Daggett informed the membership that 12 of the 15 states that attended the 1922 annual meeting had ratified the articles. Some problems developed, however. New Jersey, for instance, wanted to observe the operation of its newly instituted law before ratifying the articles. Wyoming, the Secretary reported, had not been heard from. But the most serious objection came from Illinois. Although Condron, who had been active in the Council since its inception, had recommended ratification, A. M. Shelton, director of that

state's Department of Registration and Education, objected to the first sentence in Article I, which granted reciprocity to applicants from states already members of the Council. This, Shelton believed, contradicted Illinois law, which required that all applicants take a written examination. Since the articles did not require such a test, Illinois could not ratify them. Daggett, therefore, wrote the original committee members who framed the articles, asking for their interpretations of the first article, and, as they suggested, put the issue on the program of the fourth annual meeting under New Business.

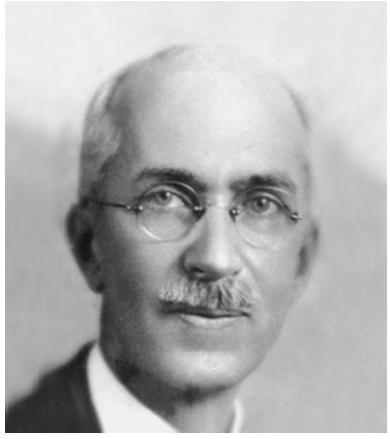
During the 1920s the Council worked industriously to develop a system for granting engineers reciprocal registration. This was not an easy task because of the nature and variety of the different state laws. Some were stricter than others, and some allowed only their particular Boards to test applicants and register engineers. Another problem was that the Boards themselves varied in their standards. Because of these problems, the representatives hit upon the idea of the reciprocal registration card, which was a form printed by the National Council and given to the various Boards. At the 1923 meeting, a motion passed to form a committee to draft such a card. In the 1924 Revised Articles of Agreement Relating to Reciprocal Registration of Engineers, Articles six, seven, and eight describe the procedure for using the cards. If a Board found a candidate's qualifications satisfactory, it could grant reciprocal registration by means of certification from one state to another. This certification took the form of the reciprocal "card bearing the date, serial number, and signatures of the officers and the seal of the Board of the state issuing the same." This card became *prima facie* evidence of qualification and was to be accepted by all states subscribing to the Articles of Agreement. The committee concerned with reciprocal registration cards reported in 1924 that the reciprocity forms that Arizona developed be used, with some changes, as the model for the national card. By the 1925 meeting, Secretary Keith Legaré could report that 5,000 reciprocity application blanks had been printed and distributed to the Boards.

During this first era, the Council struggled for existence. The delegates from the active Boards often paid their own travel expenses to attend. The Secretary, who single-handedly held together the loosely federated group, worked with little or no remuneration. Some of the largest and most powerful states, such as California, New York, and Pennsylvania, either would not or could not participate. But the foundation was laid and the materials assembled in preparation for the Council's rapid development in the second stage of its existence.

Marcel Garsaud
Louisiana
1920–1921

C. S. Hammatt
Florida
1921–1922

John J. Cox
Michigan
1922–1923



G. M. Butler
Arizona
1923–1924

L. M. Martin
Iowa
1924–1925

P. H. Daggett
North Carolina
1925–1926

CHAPTER 2
The Structure Erected
1926–1945

At the Council's 1926 Annual Meeting, the tone had changed from tentative deliberation to focused debate. Eighteen states were now members. Tennessee, South Dakota, Arkansas, and Idaho had joined that year, and all had ratified the Articles of Agreement that outlined the requirements for reciprocal registration. Secretary Legaré could report with pride that the "Council is now evidently recognized as an authority on engineering registration and the Secretary's office is rapidly becoming a clearinghouse for information on the subject." The Council was firmly established. Its members now were ready to attack the major problems of the engineering profession.

At the 1924 convention, the subject of framing a Model Law was broached, and a committee was formed to consider this question. Such a law was to function as a model for states to follow in formulating their laws in order to bring some uniformity to the current state of chaos. This issue was tied to reciprocity since one of the roadblocks standing in its way was the lack of agreement among state laws. The Council recognized, however, that absolute uniformity would not be possible since every state had its own peculiar needs and requirements. (California, for instance, would be more concerned with earthquakes than would many other states.) But a Model Law would help limit the diversity as much as was practical.

The committee examining the issue found that the American Society of Civil Engineers (ASCE) had framed a document entitled Form of an Act of Legislation for Registration of Professional Engineers that its board of directors approved on January 20, 1925. The committee found the document to be "a valuable piece of constructive work" and recommended that the Council tentatively adopt it and make suggestions for revisions based on its experience administering registration laws.

Much of the 1926 meeting was spent establishing the basic nature of the proposed registration law. Out of this often acrimonious debate came some of the basic requirements for a Model Law. It was agreed that engineers should be "registered," not "licensed." The Council debated but did not resolve the issue of whether the registration certificate should show a specialized branch of engineering. This was an important question that also affected the nature of the examinations. They agreed that the examinations should contain both written and oral material and that detailed questionnaires be sent to those furnishing references in support of an applicant. In short, many of the most fundamental questions about the nature of a model registration law were subjected to extensive debate, and many of those questions were answered.

Other important issues also received attention. The delegates discovered a serious weakness in Article 7 of the Reciprocal Agreement, which stated that if an engineer with adequate qualifications applied for reciprocal registration from "his own State Board," he should be granted it. The problem centered on the interpretation of the quoted phrase—did it mean the state of

the person's legal residence or his business address? Some delegates feared that many engineers would be able to get reciprocity from states other than their own, and some delegates felt that this would slow up the development of new state laws since engineers living in states without laws would be able to register in neighboring states having laws. The Council decided to interpret the phrase to mean the person's state of legal residence. (However, in 1927 the same issue arose again. This time the delegates passed a resolution allowing engineers to register in another state if their home state had no registration law.)

The Council also took the first steps in 1926 toward certifying engineering schools. President Daggett and a Council committee compiled a tentative list of acceptable schools after reviewing school catalogs. The list had some noticeable omissions, so the Council accepted it as tentative and continued the committee for another year. But this list was the beginning of the Council's role of reviewing and evaluating the curricula of engineering programs across the nation.

"Engineering School" Defined

In 1927, Daggett, through the Committee on Classification of Colleges, defined what the Council considered an engineering school:

> An engineering school of recognized standing shall be one which requires the equivalent of a high school or preparatory school diploma as an entrance requirement and demands the equivalent of a four year's course in engineering for graduation.

Daggett and the Committee prepared a supplementary list of schools based on the 1926 list by further investigating the curricula. Schools of unquestioned reputation remained. Removed from the list were some schools that did not fulfill catalog descriptions or that did not offer courses in all branches of engineering.

One serious problem the committee addressed was the culling of fake mail-order schools advertising in magazines like *Popular Science Monthly*. Misleading advertisements promised students that after spending $50 for books, they would make $500 to $600 per month after graduation. These schools of course could not appear on the list because the curriculum and the instruction were limited. Since the American Association of Engineers had been the first organization to suppress these fraudulent schools, the Council resolved to support that effort.

A related question the committee addressed was to see if those graduating from curricula in landscape architecture should register under the engineering registration laws. It found that few programs required more than two or three engineering courses, and many delegates at the meeting objected to landscape architects using the title "engineer" even though they did perform some surveying and engineering functions.

During the 1927 Annual Meeting, Daniel B. Luten of Indiana raised the important issue of enforcement of registration laws. The Indiana legislature had given the State Board the power but not the money to collect evidence and prosecute violators of the law. This was a common problem in many states. When the Florida Board did hire a deputy to investigate all individuals advertising as engineers, it discovered about 200 nonregistrants. Approximately 100 took the exam, but the rest left the state. This suggests that many people claiming to be engineers were not qualified to meet the standards set by the registration laws. The Council passed a resolution that the Boards should not merely examine applicants but that a "further duty consists in seeing that the certificates of

registration are not violated." It would take many years, however, for the Boards to become effective enforcers of the laws.

By 1928, after several years of excitement and development, the delegates to that year's convention recognized even more clearly than before that true reciprocity remained elusive. President George E. Taylor noted that one of his most important duties was to encourage other states to join. To this end, he traveled during the summer to Boards of New York, Pennsylvania, and New Jersey to convince them to join the Council. Taylor suggested that the Council be willing to change its Constitution in order to accommodate the strictures of the laws in these states, for without the membership of the huge eastern regions, the effectiveness of the Council's work would remain only marginal.

Perhaps the following comment by G. M. Butler from Arizona, who had attended the meetings for many years, expressed the frustration of many delegates: "The more I attend these conventions the more I realize the utter futility of coming together on any uniform registration laws. We all have our idea and think each one is the best, and I doubt if anything said here can change it."

Many problems indeed still existed. All states with registration Boards had not joined the Council, and many states had not even progressed to the point of having registration laws. Probably sensing the frustration of many delegates, President Taylor in his address to the conference comments:

> It is well for us to look to the future, picture the true situation as it now exists and make our plans anticipating a more ideal condition when all the states having registration laws for engineers will be members of our Council, when all the states will have registration laws, when the requirements are more nearly equal in the different states, when methods of examinations and registration more nearly agree, when we can quickly, easily and cheaply grant reciprocity between every other state, when there are no petty jealousies between states, when there is a proper relationship and understanding between the general practitioner and the specialist, or the city and the country, the big states and the smaller states, when—yes, when this all has been accomplished and perfected, we will probably all be in Heaven or elsewhere.

But after painting this frustrating picture, he goes on to outline the Council's accomplishments since its beginning.

By 1929, the brief period of frustration had ended. The person most responsible for this was T. Keith Legaré, the Council's Secretary, who probably more than any other individual, directed the Council through the difficult early years. Legaré, with typical energy, was instrumental in having the Council and the American Society of Civil Engineers (ASCE) join to study the problems of state registration. Legaré would serve on this new committee, and he suggested that representatives from all the national engineering societies join in the effort.

In the meantime, the Council continued addressing the problems related to reciprocity and uniformity among the State Boards. The Committee on Procedures of Engineering Registration Boards had that year surveyed the various State Boards to determine what kinds of examinations each gave. As might be expected, it found much diversity. Three boards, for instance, required only an oral examination, while six required only a written exam, and eight required both. With some alarm, the committee reported that most tests did "not equal what might be expected from a recent college graduate." The subjects tested also varied greatly, and the committee recommended that the Council

work toward uniformity of content, grading, and other such matters, and made numerous suggestions for standardizing the examination and certification process.

The delegates also discussed the national reciprocity cards and the numerous problems associated with them. Some states, it was noted, might want to allow an engineer to practice in their jurisdiction without granting him a card certifying him to practice elsewhere. A number of questions loomed. By going though the registration process, did an engineer automatically receive the card? What happened to an engineer holding a card who lost his good standing in his home state? Did he still retain the card allowing him to practice in other states? Also, what happened to the cardholder who allowed his license to expire for nonpayment of the renewal fee? As these questions suggest, the reciprocity cards did not allow the Council and the State Boards to maintain adequate control over the reciprocal certification of engineers.

Uniform Registration Law Discussed

Another important issue discussed was the new national interest in drafting a "recommended uniform registration law for professional engineers." In 1919, the American Engineering Council had prepared such a law, and between 1918 and 1922, 18 states had enacted registration laws. After that period of activity, however, the rate had slowed. By 1929, interest had been renewed, and there was a movement among the various national engineering societies to join forces to draft a new law. The Council viewed this as a good idea and passed a resolution agreeing to join with the American Society of Civil Engineers, the American Society of Mechanical Engineers (ASME), the American Institute of Electrical Engineers (AIEE), the American Railway Engineering Association (AREA), the America Association of Engineers (AAE), and other such organizations to work on the project.

Achieving registration on a nationwide level would not be easy, however, as C. J. Ullrich of the AAE made clear in a talk before the Council. The first major problem was due to the engineering profession itself. By this time it had become divided into two camps, the older ones against registration and the younger ones in favor of it. Many of the younger ones, often college graduates, felt confident in their ability to pass the examination and meet other requirements. The older members of the profession, many of whom had either advanced through experience or who had been out of school for many years, lacked that sense of confidence.

Another problem Ullrich foresaw was due to the lack of uniformity of state laws. Such uniformity was necessary in order to develop a consistent approach to registration, but uniformity could be achieved only through a coordinated national campaign rather than a slow, politicized attempt to standardize all the current laws. As history would show, the Council played a major role in the movement toward this uniformity by coordinating the individual efforts of the various organizations and societies of the engineering profession.

Ullrich's third point was that the engineering profession had to be convinced to support the registration laws. The states needed competent Board members, and the engineers of each state needed to support those Boards. Even a weak law that was properly enforced could be effective, but the converse was also true.

Ullrich also outlined why the profession needed registration statutes. These laws protected the public and gave it confidence in the engineering profession. If engineers were to ease the public's mind concerning the integrity of the profession, those not qualified should be screened out. Finally, a uniform registration law would help establish a professional code of ethics. "Engineering," Ullrich noted, "is the only profession today that has no established code of ethics."

As the Council entered its second decade of activity, its members perhaps did not realize how great a role it was to play in achieving Ullrich's goals. In an editorial in *Professional Engineer*, Ullrich noted a new focus in the Council's purpose. Rather than simply helping engineers achieve reciprocity more conveniently, the Council decided "that the function of the various State Boards of Engineering Examiners was to deal with engineering from the public standpoint rather than from a professional standpoint," and that the Council's work and rulings were leading the profession toward a code of ethics.

Another indication of the Council's increased importance is that the delegates approved that the Secretary-Treasurer receive a salary of $300 and an additional $300 for clerical support. While hardly adequate compensation for the hard-working Legaré, it does indicate that the Council was a vital and growing concern.

Another indication of the Council's growing reputation in the profession was the October 1930 editorial in *Professional Engineer*:

> We know of no other engineering organization that holds within its grasp more potent weapons for the benefit of the profession than this board. Its intimate touch with the functioning and operation of registration laws, their points of strength and weakness and their effect on both the public weal and the morale of the profession place this organization in a position to be the profession's greatest benefactor. *Professional Engineer* looks forward to worthwhile professional accomplishments from this organization in the next few years.

National Bureau of Engineering Registration Proposed

In 1930, the most important piece of business was the proposal that the Council sponsor, in connection with other national engineering organizations, the National Bureau of Engineering Registration (NBER). The inspiration for this body came from the 1930 report by R. E. Warden's Committee on Codification of Engineers, Architects, and Surveyors Laws in the United States and Countries Contiguous Thereto. This committee reviewed all the state laws, but it also examined those of Canada. It found that the association of British Columbia had developed a "professional system" to help students develop into engineers. To accomplish this, it devised three categories: (1) Engineering Pupil, for those 19 to 23 years old, generally third-year university students; (2) Engineer-in-Training, for those who either passed an intermediate examination or had graduated in applied science; and (3) Registered Professional Engineer, for those who had passed the final examination and had appropriate professional experience.

From this program, Legaré, holding the presidency that year, wrote an article attached to the minutes arguing for a bureau in this country to perform a similar function and other duties. Since it would be coordinated by the Council with representatives from other organizations, the NBER would function as a national body to oversee, coordinate, and standardize the education and certification of engineers.

Legaré proposed the Bureau in order to solve several nagging problems the Council had faced previously. First, it would administer a national examination that would regularize the discrepancies of the State Board tests. Second, it would help State Boards achieve more nearly uniform registration by presenting a certificate of registration that all could accept. Third, it would prescribe "a formal

procedure of education and training," thus making university curricula more consistent and establishing guidelines for assessing experience of applicants. By accomplishing these goals, the Bureau would help establish a set of ethics.

As the Council's representative to the ASCE's committee to frame the recommended Uniform Registration Law, Legaré also reported to the delegation in 1930 that he had attended three conferences with representatives from other national organizations. The ASCE Committee on the Registration of Engineers had asked him to draft a suggested form of the law for the representatives to consider. He had sent this document to the Council's committee on the project and to most of the past presidents for comments. Legaré recognized that the law was not perfect and would be amended as the interested organizations discussed it. He also realized that it would not meet the needs of all states, many of whom would have to modify it. After some debate, the Council endorsed the law, and by the time the 1930 minutes went to press, 16 organizations had done so.

By 1931, the Depression began to influence the engineering profession in earnest. Money was scarce, and many engineers did not renew their certificates. As jobs became hard to find, engineers became more concerned with supporting their families than with working for the common good. As Secretary P. H. Daggett commented, engineers "have been more concerned recently with securing positions than in promoting what some of them consider an unnecessary nuisance…." But progress continued. Kansas adopted a registration law, and finally, New Jersey and Pennsylvania joined the Council.

Embracing Legaré's suggestions for the NBER, the Council worked out some general guidelines for the Bureau's duties and its organization. Because of Legaré's 1930 paper, the ASCE's board of directors set up a committee to study the subject and approved the idea; it suggested that the Council do so too. As the delegates to the convention discussed the issue, it became clear that the reciprocal registration cards were obsolete. They had never worked, and few of them were actually used. As D. B. Steinman from New York commented, "If the national bureau set up sufficiently high qualifications for such certificates (from the NBER), this certificate can easily be accepted at its face value by all the boards, and it would have a higher standing than a certificate of reciprocity from an individual board."

The Council approved the Bureau and made a number of important determinations. First, it should be under the direction of the Council and function as a fact-finding and certifying body. This would ensure that the Bureau remain in touch with the State Boards rather than drifting away from them. Second, it should be self-supporting through fees from applicants. Third, it should have a fulltime executive secretary. Fourth, its purpose should be "to investigate and verify the records of applicants" and to issue certificates to those who qualify. Fifth, it should be administered by a committee of the Council who would be assisted by an advisory board made up of representatives from the major national engineering organizations.

The Committee on Procedures of Engineering Registration Boards gave its report and suggested that considerable variety still existed between states. The Chair, Dean G. M. Butler, attempted to define the aims of the Boards: to register competent engineers with the least trouble to them. Boards should devote their energies "mostly to preventing the practice of the palpably incompetent or dishonest and to investigate the borderline cases." Some Boards, Butler complained, mistook their duties and tried to become educational institutions. They should instead determine qualified engineers on the basis of their work record and education and test a candidate only when they needed additional information. As for the examinations themselves, most Boards still designed easy tests, but several Boards, Butler found,

gave "examinations that apparently could only be passed by a college graduate with considerable experience." In short, he concluded, "approximately as much diversity of practice now prevails across registration boards as was the case two years ago."

The Committee on Accredited Schools also reported that it was time to "adopt more comprehensive and discriminating standards" for evaluating engineering schools. Although the New York Board had a list of approved schools, as did the ASCE, the Council decided that, with its growing influence and the emphasis on education in the model registration law, it should take the initiative on this matter. Following the suggestion of Steinman, the Council decided to form a committee and invite other national engineering bodies to send representatives to form a joint committee "to set up an improved set of standards for accredited schools, and for formulating a definite program for listing accredited schools."

Unity of the Profession Discussed

The convention also took up the issue of the unity of the profession. This was an important issue because there was always the threat that the various divisions of engineering would disassociate themselves from the rest to form independent subdisciplines. This, of course, would have harmed the profession by diluting its influence. To avoid the danger, Steinman offered a resolution that (1) affirmed "the essential unity of the Engineering Profession" and (2) stated the Council's opposition "to any legislation tending to break down the solidarity of the Engineering Profession." The Council also adopted the following statement of purpose designed to show its relationship to the unified profession:

> The purpose of this Council shall be to promote uniformity of practice in the administration of state registration laws for professional engineers and land surveyors, to establish and maintain a system of national qualification for registration, to provide for reciprocal relations between State Boards, and to foster any movements having for their aim the promotion of the public welfare through engineering registration and the improvement of professional standards.

By promoting these four central concerns, the Council worked to unify the profession.

In his address before the entire body of delegates at the October 1 Annual Banquet, Vice-President Steinman returned to the danger of fragmentation by reporting on a legal battle going on in New York. The architects, being better organized than the engineers, had managed to amend their licensing law to allow only architects to design and build structures costing more than $10,000. Always an independent group, the engineers of the state were slow to pass their own licensing law and now found their professional "rights" gravely curtailed. Part of the problem was the factor mentioned above—the tendency for engineers to fragment the profession into specialties, thus diluting their political effectiveness. Steinman called for a campaign of publicity and education to strengthen the engineering profession and to improve the image of the profession in the public's mind. For instance, he had started a campaign in New York to prevent the misuse of the term "engineer" as used in such phrases as "radio engineer," "amusement engineer," or "social engineer" that served to undermine the profession. As long as engineers refused to view themselves as a profession and to maintain their professional integrity by demanding high standards of certification, they would continue to suffer from a lack of a positive image in the public's mind and from an inability to protect their rights in legal battles with other groups.

Model Law Adopted

By the 1932 meeting, much had been done to accomplish this aim. During the year, the Model Law for the Registration of Professional Engineers and Land Surveyors had been adopted and the National Bureau of Engineering Registration had been established.

Now another important organization began to take shape, the Engineers' Council for Professional Development (ECPD), and the Council was asked to participate in it. The ECPD concept arose in 1928 when the ASME appointed a committee on the Economic Status of Engineers. When the committee reported in November 1931, it noted that the profession needed a method to clearly distinguish between engineers and nonengineers, between those prepared to function as professionals and those who were not. This second group hindered the development of the first by performing sloppy work and by underselling the services of the qualified engineers. The committee called for a "program of selection, guidance, training, and certification, covering the entire period from high school to admission into the Profession…." Because of this report, the ASME in 1932 called for all national organizations to attend a conference on the Certification into the Engineering Profession. Since the Council had been working to develop the National Bureau of Engineering Registration (NBER), which was working to achieve many of the same goals, the two movements came together at this conference.

ECPD Is Developed

On March 14, 1932, the Planning Committee, chaired by General R. I. Rees of the Society for the Promotion of Engineering Education (SPEE), met with representatives from all major societies and organizations. D. B. Steinman attended for the Council and helped draft "A Plan for Joint Action in the Development of the Engineer" that called for the formation of the Engineers' Council for Professional Development. This was to be run by a committee composed of representatives from the major engineering societies, SPEE, and the National Council.

Thus, for the first time, a broad, professional consensus appeared because all interest groups important to the engineering profession had a voice. The profession itself was represented by the major professional organizations such as ASCE and ASME; the educators by SPEE; and the certifying agency by the Council.

Although the general objective of the ECPD was the "enhancement of the status of engineers," the immediate objective was more practical:

> The development of a system whereby the progress of the young engineer toward professional standing can be recognized by the public, by the profession, and by the man himself, through the development of technical and other qualifications which will enable him to meet minimum professional standards.

To achieve these goals, committees were established (1) on Student Selection and Guidance, (2) on Engineering Schools, (3) on Professional Training, and (4) on Professional Recognition.

The reasons for the ECPD's development were complicated. The profession had come to realize, as the Council had realized a decade earlier, that it had to distinguish between the competent and incompetent engineer. While a college degree in engineering was a measure of qualifying as a competent engineer, many practicing engineers who learned by experience were competent so that a degree did not always distinguish between the competent and incompetent engineer. Neither did membership in a

national engineering society since such societies had different standards for admissions and admitted nonengineers. Thus, the founders of the ECPD committee agreed with the position which the National Council had held for many years: that registration or licensing was the only clearcut way to establish enforceable criteria for entrance because it had the status of law.

The profession should therefore strengthen the registration laws in those 28 states with such laws on the books. It should also unify and coordinate standards in agencies of "education, organization, and registration" in order to "replace chaos with order, conflict with harmony." The ideal to be achieved, therefore, was to regulate systematically the three areas of interest to the professional engineer: the professional degree, membership in the professional societies, and registration by the State Boards.

The Council, which had already been working in all of these areas, and had indeed proposed a similar approach, approved the plan for the ECPD and accepted the invitation to participate in its formation and administration. It sent as delegates Daggett, Legaré, and Steinman.

Meanwhile, the Council's Committee on the National Bureau of Engineering Registration reported the progress made on developing that organization. Colonel Hugh Q. Kelly, the Chair, read the report recommending that representatives of all the societies, the engineering schools (through the SPEE), and the Council be brought together to develop a "unified plan" to help young engineers develop into professionals. The program should lead to certification, which, because of the applicant's progress in education and professional experience, would represent admission into the profession. The overriding purpose of the NBER would be to review the records of applicants and issue a "Certificate of Qualification" to serve as evidence of qualification to those states and organizations recognizing it. The headquarters were to be in Columbia, South Carolina, in the offices of Legaré.

The Committee also recommended a clearcut set of qualifications by which applicants could receive certification. First, they could have graduated from an approved engineering program and have four years of additional experience. Or, second, they could pass a written or a written and oral examination and have eight years of experience. Or, third, they could have 12 years of distinguished professional experience. It is interesting to note that the examination served only to expedite certification and that the graduate and the distinguished practitioner did not need to take it.

Despite this weakness, the NBER represented the first systematic attempt to manage certification on a national level. It was not yet completely successful. Many states still did not have registration laws, and some of those that did could not legally accept such a certificate. But many states could accept them, and this was a major step toward true reciprocity. It was also a clear movement away from the troublesome National Reciprocal Registration Certificates, though the Council agreed to honor those already issued.

Interestingly enough, the first applicant failed to earn certification. He was a carpenter from Texas who simply did not have the necessary background, and his rejection established the Bureau as a firm but fair body. Its procedure was clearly legitimized. An applicant needed to provide five references from engineers, information on his education, and information on all states in which he was already registered; and take the appropriate examinations, present memberships in professional societies, and list all experience. The Bureau built a file from all of this material which functioned as a professional profile of the individual. When the file was completed, the Bureau would either grant or deny certification. If granted, the applicant could then present this certificate to the State Boards.

Among the recommendations of the Kelly report were that the Bureau be approved, that the State Boards agree to accept its certificates, and that the new Engineers' Council for Professional Development be requested to cooperate with the Council in supporting the Bureau. On December 1, 1932, the Council officially approved the establishment of the Bureau.

Financial Support Discussed

The delegates to the convention also discussed the problems of money and financial support for the Council. The procedure before had been for each state to contribute between $50 to $100 depending on its size. But this did not generate enough money now that the Council's functions were expanding, and it also put a burden on the smaller, less populous states. The delegates decided to change the assessment method by charging the Boards 10 cents per registrant and changing the minimum payment to $25 and the maximum payment to $50 per year.

At the 1932 Banquet, a series of speakers from various professions addressed the delegates. These speakers, though from different backgrounds, all made a similar point: that the engineering profession must assume new responsibilities in a society that increasingly depended on its scientific expertise. Arthur V. Sheridan, acting as toastmaster, noted that "the entire structure of modern society demands that the scientist and engineer assume responsibility for the well-being of humanity," and that society must combine the physical with the spiritual. Senator Thomas C. Desmond of New York warned the delegates that engineers needed to organize on social and human issues to complement the amount of influence they had had while developing the "machine age of civilization." Julius Henry Cohen, a lawyer, argued—under the influence of the Depression—that engineers and lawyers need a "measure of collectivism" to avoid the dangers of unrestricted competition, which he called the "law of the jungle." Frederick B. Robinson, president of the College of the City of New York, supported the view that the contemporary engineer needed to be "broadly cultivated if he is to be a superior worker," and pointed to Leonardo da Vinci as an ideal for the profession. Finally, David B. Steinman, a member of the Council, argued that the profession should strive to have legislatures recognize engineering as "a learned scientific profession," not just a field of limited empirical study.

These talks, given by men in different professions, represent an extraordinary concept of "the New Engineer." This person would be broadly educated and passionately concerned about social issues and the welfare of the public; he would reject the limitations of the competitive spirit and work for the good of the profession. This concept well illustrates one of the most important functions that the Council played—that of providing a forum for new, even visionary ideas about the engineering profession and its role in society.

New Constitution Approved

President O. Laurgaard opened the 1933 convention by announcing that the main piece of work before the delegates was approval of the new Constitution and Bylaws, which he had drafted during the past year. He had taken up this task because the old Constitution, drafted in 1920 and amended piecemeal since then, no longer met the new and growing needs of the Council. The Constitution, though, did not address new matters. Instead, it codified many of the developments and actual practices of the organization. After much discussion and debate—and some unhappiness and hard feelings—the delegates approved the documents with minor changes.

The Constitution clarified the purpose of the Council, which was:

> to promote the public welfare by improvement of professional engineering standards through uniform administration of State Engineering Registration Laws, the facilitating of reciprocal relations between State Boards, and by defining and maintaining National Qualifications for Registration.

Two parts of this statement are particularly important. First, it emphasized the promotion of the public welfare, which had become a greater concern of the Council in recent years. Second, it emphasized the Council's role as the body maintaining *national* qualifications. This marks the organization's steady move toward becoming a centralized, national body rather than a loose confederation of isolated State Boards.

Although the officers of the Council remained the President, the Vice-President, and the Executive Secretary, several important changes in the administration appeared. First, the Secretary, unlike the other two officers, served at the pleasure of a newly formed Board of Directors. Thus, the Secretary became an employee who could hold office indefinitely. The advantage of this, as shown by the long tenure of Legaré, was that this provided for continuity in the Council.

The Board of Directors consisted of the President, Vice-President, the retiring President, and four members of Member Boards. This Board, as Article III of the Bylaws states, would have direct supervision of the financial affairs of the Council; would have authority to engage the necessary employees to properly conduct the affairs of the Council; would authorize all expenditures before payment; and would make recommendations to the Council for the investment of moneys and in other financial matters.

In short, the Board had the authority to conduct all of the Council's business between its annual meetings. It also directed the activities of the Secretary, and it had the power to investigate charges brought against any member of the Council.

The four members from Member Boards were to be representatives from each of the four zones that the Constitution and Bylaws established. These divided the country into the Western, the Central, the Southern, and the Northeast Zones. In effect, a hierarchical organization was established that allowed State Boards of each region to discuss regional issues that could later be brought before the Council as a whole. Each had a director that served on the Board of Directors.

The Bylaws also set up both standing and special committees. The six standing committees were established to address the Council's major interests. There were the Committee on Accredited Engineering Schools, the Committee on Uniform Examinations for Registration, the Legal Committee (which kept track of all court decisions affecting the engineering profession), the Committee on National Bureau of Engineering Registration, the Committee on Engineers' Council for Professional Development, and the Committee on Constitution and Bylaws. These structures were designed to advance the Council's work in such areas as the Model Law, uniform registration, the accreditation of engineering schools, and other such concerns. In addition to these permanent committees, the President could appoint special ones to facilitate the business of the national meetings.

Although the Constitution and Bylaws clearly demonstrate that the Council was rapidly becoming a powerful national body, not all delegates at the 1933 meeting approved of this development. During the discussion of the National Bureau of Engineering Registration that had been

approved at the 1931 and 1932 conventions, a group of delegates attacked the principle of the organization and wanted it disbanded. Their argument rested on the issue of states' rights. The power of judging and certifying engineers, their argument went, should rest entirely with the states, and several states had laws that explicitly required this. The Bureau, then, would simply force engineers to pay additional fees for certification that would not be nationally valid. The motion to disband the Bureau failed, however, because most delegates, among them Steinman of New York, argued convincingly that the Council's Articles in no way required State Boards to accept any certificate if they chose not to.

Uniform Exam Established

Other important business included the report from the Committee on Uniform Examinations for Registration. This committee established the areas that each applicant would have to pass in order to become registered by the various State Boards. It would consist of two parts, the first lasting two and one half days; and the second, half of the third day. Part I, which tested fundamentals, had five individual tests: Mathematics, Applied Sciences, Elements of Electrical and Machine Design, and Engineering Economics, Laws and Practice. Graduates of accredited engineering schools could exempt automatically the first two tests and were eligible to exempt all but the last one if they had taken an equivalent examination in school.

Part II consisted of five special areas of engineering, and every applicant had to pass at least one. These areas were Civil Engineering, Mechanical and Industrial Engineering, Electrical Engineering, Chemical Engineering, and Mining and Metallurgical Engineering.

Another issue that the 1933 Convention addressed was the illegal use of the designation "engineer" by unregistered or unqualified persons. The Legal Committee described several lawsuits pertaining to this issue. For instance, the State Board of Examiners in Tennessee brought a successful suit against a plumbing company named "Standard Engineering Company." In New York's Brigate case, a man was sentenced to serve 60 days in the workhouse for illegally using the title "Civil Engineer" on his letterhead.

Always interested in this issue, Steinman addressed that year's banquet on the issue of protecting the title of engineer. "All of our effort to give significance and prestige to the term 'Engineer' is wasted," he said, "if any quack, imposter, illiterate, or incompetent may freely assume the title." The designation had been abused for years by individuals calling themselves heating, radio, ventilating, and welding engineers. The public often did not separate a professional engineer from a train driver. Such claims to the title irritated the true engineer who had spent years in schooling and practice. Steinman suggested that members of the Council continue working on two major fronts. First, they should continue battling for the rights of engineers in the courts, and second, they should begin a massive program to educate the public about what the term means and what the practitioner does.

The final important development at this time was the organizational meetings of the Engineers' Council for Professional Development held October 3, 1932, November 30, 1932, and March 13, 1933. Chairman C. F. Hirshfeld appointed an Interim Executive Committee to organize the Committee of ECPD, which consisted of representatives from the Council and the other major engineering organizations, and to develop rules and procedures. Four committees were established on Student Selection and Guidance, Engineering Schools, Professional Training, and Professional Recognition. The Council's request for the ECPD's cooperation in the direction of the NBER was referred to the final committee. The ECPD representatives also prepared a Charter and Rules of

Procedure. The delegates at the Council's 1933 convention approved the report and expressed support for the ECPD's charter. Three delegates to the ECPD were appointed.

Depression Gravely Affects Council

By 1934, the Depression and Roosevelt's programs began to gravely affect the Council. In his banquet address, President N. W. Dougherty sadly noted that engineers were becoming despondent due to the precarious position of the profession "during these days of stress." In the depressed economy, for instance, engineering could no longer develop new inventions and new processes. Another sign of the Depression's effect was reported by W. Austin Smith of Florida. He painted a bleak picture of the new "alphabetical agencies" such as the CWA, FERA, PWA, ECW, HOLC, and the Farm Loan Bank that allowed unregistered individuals to practice engineering. "Someone waved his arms over the valley of dry bones," Smith commented, "and an army of square pegs were brought to life; insurance agents, hot dog stand operators, country school teachers, farmers—all came into a new life as engineers or surveyors." Finally, a third sign was that the Council had nearly become penniless during the year. Because of the dreadful state of the economy, several Member Boards had not yet paid their dues, and Legaré graciously suggested that unpaid membership fees for years previous to 1934 be cancelled and that the remainder of his own salary, $476.50, be cancelled also. President Dougherty, however, requested that several Boards pay a "special assessment" in order to remit to Legaré his entire salary.

While Dougherty, in his opening address, could point to many accomplishments over the years, he had to admit that the Council had not solved its financial problems. Even though engineers seemed to like the idea of the National Bureau of Engineering Registration, few had used it, so only a small amount of money from Bureau fees entered the Council's account. Furthermore, the Colorado Board withdrew from the Council because it could not subscribe to the Rules and Regulations of the Council, especially as to the NBER. Fortunately, to counteract this withdrawal, Ohio and Puerto Rico became members.

Accreditation Regional Committees Formed

Despite these problems, the Council continued its work. The Committee on Accredited Engineering Schools brought before the Council the question of formal approval of ECPD's program for accrediting engineering schools. This plan called for the formation of seven regional committees with chairmen who are members of the ECPD. Each committee would evaluate schools in its district and report findings to the ECPD for final action. Also, the ECPD would establish a permanent staff headquarters to process this information and to handle correspondence and statistics.

The ECPD would accredit each program of an institution individually and would recognize six major curricula: Chemical, Civil, Electrical, Mechanical, Metallurgical, and Mining Engineering. It would collect both quantitative and qualitative data about each institution. Quantitative data would come from information found in catalogues and other publications and from questionnaires the ECPD was now developing. Qualitative criteria would come from on-site inspections during which intangibles such as faculty interests and abilities, quality of instruction, scholastic work of students, and records of graduates would be evaluated.

The Committee on Uniform Examinations also reported, but its presentation received considerable criticism, especially from Steinman, who had headed the committee in 1932 and 1933. The current committee wished to make some changes in the Steinman plan. First, they found the

three-day exam period and the numerous required areas "too long, technical, and severe." They wished to combine the examination entitled "Engineering Economics, Laws and Practice" with some or all of the examinations of Part II, the areas of specialization. In place of this examination, the committee recommended that, as several State Boards wanted, each candidate take an oral examination to discuss his background, interests, and experience in detail. This would also replace the brief report on some project or design that the Steinman plan had recommended.

Steinman convinced the delegates to approve the body of the report (which was essentially the same as his) but to send the recommendations back to the committee for further study. He felt that these recommendations weakened the examination, which was, as several delegates commented, a model or ideal that State Boards should strive for even though they might never achieve it.

In a milder session, the Committee on the NBER reported that the Bureau was functioning smoothly even though only 60 applicants applied for certification since the previous Convention. Total receipts were only $592, and all of that went to overhead. But one registrant from West Virginia secured registration in Ohio and California on the strength of his certificate, and he estimated that he had saved $14 and much inconvenience.

Meanwhile, the ECPD was also active during the year. It was successfully giving high school students guidance and was planning to compile and revise literature on engineering after consulting the National Occupational Conference and other such sources. The ECPD also sent out a questionnaire to junior members of the profession, the results of which suggested that this young group wanted assistance in furthering their development professionally, personally, and culturally. This would be provided to him in the form of reading lists and pamphlets as well as training and guidance programs. The ECPD's Committee on Professional Recognition suggested that "a goal of attainment" be established to help the young engineer strive to develop throughout his career. It would be in the form of a certificate "equivalent to the professional degree and having value recognizable as adequate to entitle the holder to licensing or registration in a state" as well as admission as a member into a professional engineering society.

The ECPD also established "minimum qualifications for an engineer," which consisted of either (1) graduation from an approved four-year engineering school, an additional four years of practical experience, and the passing of an oral and written examination; or (2) eight or more years of active practice and the passing of the written and oral examinations. To make certain that the grades of professional societies corresponded to these minimal standards, the ECPD recommended that engineers and aspiring engineers be classified as Student Member, Junior Member, or Member.

In an important decision, the ECPD recommended that the thousands of established engineers not be examined, but that an across-the-board program be gradually put in place to establish a consistent examination procedure for all engineers. Until January 1, 1936, it would grant certification registration to all registered engineers. Until January 1, 1937, it would grant certification to all registered engineers having met requirements equal to those spelled out in the Model Registration Law, to those certified by the NBER, and to those earning the grade of Member or higher in a national society. After this date, the ECPD would grant certification on an individual basis by applying to the Bureau of Certification then being set up to receive and review applications, to check references and credentials, and to conduct examinations. Until January 1, 1938, those candidates obviously qualified would not have to take the examination, but after that date, no new applicant would be excused from the examination, though the candidate could submit an original thesis or publication to function as the equivalent of the written examination. After completing the

requirements, applicants would receive ECPD certification—*prima facie* evidence of qualification for registration by a State Board.

Two points deserve special attention. First, this program was the first attempt to make the certification process completely uniform for all engineers. After the beginning of 1938, all engineers would have to take the examination to receive ECPD approval and certification. Second, the activities of this organization duplicated the activities and goals of the Council's Bureau of Registration. It would be several years before this overlap was resolved.

Courts Strengthen Council

Several court cases in various states served to strengthen the position of the Council by upholding the principle of registration. In Tennessee, the Supreme Court of that state upheld a lower court decision that A. Herbert Rogers, a decorator and designer, could not use the title "associate architect." The case is important because the court defined the terms "Public Health and Safety," declaring that architectural matters affecting the public safety, such as designing or building a structure, required the skills and supervision of a licensed architect or engineer. Thus, unregistered individuals violated the law if they advertised themselves as architects. Since these individuals could well be incompetent, they are potentially harmful to the public welfare. Cases in California, New York, Florida, and Wyoming also, to one degree or another, supported the legality of registration.

The delegates also discussed some methods of enforcing the state registration laws, always a problem since the State Boards are undermanned and without adequate funding. Steinman reported that the New York Society of Professional Engineers had simply sent out letters explaining the law to all persons advertising unlawfully in the telephone directory. Of the 129 offenders, 82 changed their advertisement and 6 secured their licenses. Steinman also convinced his state to increase the number of inspectors to investigate cases, with gratifying results. Other states reported that they, too, had difficulties with enforcement but were working on effective methods.

National Society of Professional Engineers Founded

Another important development during 1934 was the establishment of the National Society of Professional Engineers (NSPE). This body, whose membership would be composed of registered engineers, was developed to support the work of the Council and its National Bureau of Engineering Registration. At the 1932 convention, representatives from state engineering societies had suggested that the state societies should work to support the Council financially, and this suggestion led to the establishment of the NSPE. Legaré assumed the position of Executive Secretary, thus ensuring the coordination of the Council, the Bureau, and the NSPE.

In his 1935 report, Legaré attempted to clarify the major role of the Council as the body best suited to coordinate the activities of the State Boards and to function as a clearinghouse for information regarding registration matters. He pointed to the success of the Model Law, which had served as the basis for most new state registration laws, as the kind of service the Council could provide to the states. Because of its 15 years of experience dealing with questions of registration, the Council had become "the logical organization to advise and furnish reliable information to the state groups that are promoting the adoption of new registration laws or amendments to existing laws." Furthermore, Legaré notes, other engineering bodies such as the AEC, ASCE, and ASME frequently refer questions about registration to the Council. And as he was to comment numerous times, his staff of a part-time secretary, a part-time stenographer, and a part-time executive secretary working

on a limited budget could not accomplish all of the goals that he had set for the Council in its function as a national clearinghouse.

The ECPD continued its work on accrediting engineering schools. In order to inspect schools, the country was divided into seven regions, each with a chairman and a Council representative. These regions were (1) New England, (2) Middle Atlantic, (3) North Central, (4) South Eastern, (5) South Central, (6) South Western, and (7) North Western. The ECPD sent out letters to the presidents of all institutions in regions 1 and 2 inviting them to apply for accreditation, and it received favorable responses from more than half of the 46 schools. The first inspections were to be made on November 21–23 by the full committee of the ECPD so that the chairmen of all regions could become familiar with the procedures and develop consistent standards. Once the procedure was established, the regional committees would begin work in the other five areas.

Council Approves Three-Day Exam

More work was also done by the Council's Committee on Uniform Examinations for Registration. In 1934, largely through the energies of Steinman, the Council had approved a rigorous three-day examination. Many members of the current committee felt that the examination was too rigorous and recommended several changes based on the results of a questionnaire sent to the State Boards. First, the Boards almost unanimously wanted to retain the requirement for the personal appearance of the candidate and the oral examination. Second, most Boards wanted to drop the section on "Elements of Electrical and Machine Design" which was originally in Part I of the examination. The committee, feeling that the material was already covered in the various specialized areas of Part II (Civil, Mechanical, Electrical, Chemical, and Mining), agreed to drop the section. Third, the Committee recommended that the examination be cut from three to two days. Finally, it recommended that the Council drop the half-day section on engineering economics, practice, law, ethics, building codes, safety provisions, etc. since they too were covered in the specialized examinations of Part II.

Steinman filed a minority report attacking these recommendations, which he saw as diluting the examination. He argued that the section on Engineering Economics and Practice was a vital part of the examination since it required engineers to demonstrate mastery of subjects central to the practice of the profession. He pointed to the ECPD's governing principles for professional recognition and the "minimum definition of an engineer" which was adopted by the Council and other engineering bodies that require engineers to possess knowledge of economics. He also supported, though less vehemently, the need for a section on Elements of Electrical and Machine Design because all engineers should share the basic fund of knowledge. Finally, he criticized the requirement for oral examinations on the basis of the practical problems large Boards such as that of New York have in interviewing all candidates. It was also, he argued, a nuisance for busy engineers to appear before distant Boards. Oral examinations should be left up to the individual Boards, he concluded. The delegates were convinced by Steinman's argument, and they voted to restore the section on Engineering Economics and Practice and voted to leave oral examination to the discretion of individual Boards.

Another misunderstanding also developed during 1935 between the Council and the ECPD. The problem developed because the ASCE, ASME, AIEE, AIME, and AIChE, the organizations representing engineering registration (the Council) and engineering education (SPEE) had only one vote each. Since only five of seven votes were required to formulate policy, an inordinate amount of control fell to the professional societies.

To further complicate matters, many members of these societies continued to resist the registration movement, and this led to problems, especially since the ECPD had issued statements in various forms critical of registration and the Council's work.

In addition, there was a movement within the ECPD to set up a certifying agency that would parallel or supplant the Council. The three representatives from the Council (Steinman, Daggett, and Legaré) therefore presented a resolution on October 8, 1935, demanding that the ECPD disclaim statements unfriendly to the registration movement and the Council. It was also recommended that the ECPD should disclaim the intention of establishing another certifying agency and that all member organizations have representatives on the ECPD Information Committee to review in advance all publicity releases. The ECPD adopted the resolution, and the misunderstanding was cleared up.

Although this proved to be a victory for the Council, it also demonstrates that many of the rank and file engineers still resisted registration. Some did not recognize what was becoming a universal truth, that identification as an engineer required legal registration by a State Board. Other things such as an engineering degree and membership in a professional organization contributed to one's admission into the profession; but registration was gradually becoming the essential mark of the professional engineer. The Supreme Court, in a 1926 decision, had given support to this view by allowing states the right to provide for the general welfare of its people by protecting them from the ignorant and incompetent as well as the deceitful and fraudulent. This could be enforced by means of examinations and certificates or diplomas. Although this particular case concerned dentistry, it validated the principle that states can regulate the professions to protect the public.

Reciprocity Between States Favored

The Committee on Reciprocity and Certification gave a report which contained the results of a major survey of the State Boards and a review of the practices of other professions. The Committee found that most states did not yet favor making the National Bureau the sole means of effecting reciprocity. Most still favored reciprocity directly between the states. Most states, in fact, still did not wish the Council to interfere with their own activities, and most saw the Council's prime function as providing a forum for the exchange of ideas. Next in importance, the Council's role was to facilitate reciprocity; next, to work for uniformity of operation among states; next, to work for uniform registration laws; and finally, to design uniform examinations.

The Committee found that other professions such as medicine, architecture, and law recognized the importance of certification and registration. All important professions had state examining and registration boards and recognized the advantages of reciprocity between states. Medicine, law, and architecture had central registration agencies similar to the Council's National Bureau. The Central Medical Board, the best organized of these, enjoyed the complete confidence of the state boards. This was the ideal toward which the National Bureau was moving, although it still did not have the confidence of many State Boards of Engineering.

To help strengthen the Bureau, the Committee made several recommendations. First, it established the Committee on NBER, which would direct the Bureau. This committee would be composed of one member from each of the four zones, one from the Council's Committee on Uniform Examinations, one from the Committee on ECPD, and the Executive Secretary. Second, no states could issue reciprocal registration certificates in the Council's name. Only the NBER could officially issue certificates. The Council published in the 1935 *Proceedings* the "Bulletin of Information" which outlined the Bureau's purpose and described its functions.

Also published in the *Proceedings* is P. H. Daggett's comprehensive survey of state registration laws and Boards enforcing them. This report told when each of the 35 states enacted their laws and analyzed the laws and their coverage. It also described the makeup of the Boards and the requirements the members must meet. What the report shows is the variety of laws and Boards. It is no wonder that with this variety, Boards had trouble agreeing on principles for granting reciprocity.

By 1936, the ECPD's Committee on Engineering Schools had finished its work in the New England and Middle Atlantic Regions. The committee also worked out its method that would be applied to schools in other regions. It would first send a letter to the presidents of each school asking them if they would like to be accredited. If the presidents said yes, the committee would then send a questionnaire for the school to fill out and return. Next the chairman would select a visiting committee of approved persons to visit the school. On the night before the visit, members of the visiting committee would meet to review the questionnaire and decide on what additional information was needed. Upon arriving on campus, the committee would meet with the president or dean and discuss general policy, matters of finance, and issues raised by the questionnaire. In each institution, members of the visiting committee were assigned to inspect and evaluate various divisions, departments, and other facilities—the library, for instance. After the visit, the committee members would meet to discuss their findings and prepare a preliminary report. Later, each member would write a report to the regional chairman.

When all schools in the region had been visited, each committee met to draft its recommendations to the main ECPD Committee, and the regional chairmen prepared a final report on each institution. Four recommendations could be made: (1) to accredit, (2) to accredit for two years, (3) to accredit when certain changes had been effected, or (4) not to accredit. The full committee then reviewed the recommendations and reports and made final recommendations.

The ECPD expected to complete its accreditation program by the spring of 1937. It also expected to set up a permanent program that would require the evaluation of each curriculum every five years or so. Most importantly, the ECPD had developed a system that was workable and fair.

A few problems developed concerning the list of accredited schools. Eleven schools that appeared on the Council's 1928 list did not appear. Four of those did not appear because they did not invite the ECPD to visit, but some of the others did not pass inspection. Another minor problem was that schools with highly specialized curricula often did not appear because these were held in abeyance to be investigated at a later date. Also, some schools had evening curricula that were not approved because they were less impressive than the day curricula. But despite these minor problems, this list represented a major development in the registration movement since State Boards could refer to it with confidence.

The delegates also discussed the question of uniform examinations in 1936. C. T. Olmsted of Michigan read a paper entitled "Examinations" that raised most of the important issues surrounding the subject. He argued that, except for rare cases, most candidates should be required to pass a comprehensive examination. He was against the common practice of exempting college graduates from the tests on the grounds that no engineering college required its graduates to pass a comprehensive examination at the end of the four-year course. Furthermore, after examining hundreds of applicants for the Michigan Board, he found that a large number of the graduates failed the test the first time and many failed "repeatedly." Without such a test, these candidates would have been registered, so the examination served an important function.

To be fair, Olmsted argued, the Boards should examine all candidates. It was not the case, as some delegates had maintained over the years, that recent graduates have an advantage over older

applicants. In fact, he found little difference between the older men and the college seniors allowed to take the test early, and often the older candidate had a decided advantage on the more "professional subjects" that required practical experience in addition to a theoretical background. When Olmsted studied the results of his examinations over a period of 12 years, his results "showed very conclusively that the possession of a college diploma is not necessarily an indication that the applicant had adequate knowledge of engineering fundamentals and also that the age of the candidate has very little influence upon his ability to think clearly."

Olmsted also attacked the oral examination, arguing that it was not a substitute for the written test. It allowed candidates to bring in exhibits that may or may not be their own, and it favored the candidate with the pleasing personality, who could often pass by being pleasant. *In short, Olmsted's paper is one of the first comprehensive pleas for a universal examination of all engineers, although it would be years before the Council would act to implement these suggestions.*

Question of Eminence Arises

One thorny problem that bothered many of the delegates was how to treat the eminent engineer who had a distinguished record of practice. Should such a person be required to sit an examination? D. W. Mead of the ASCE jokingly claimed that he probably could not pass an examination, and Charles F. Scott said that if Mead could not do so, then the examination must be wrong. It should not test for knowledge of "little particulars" but for "his ability in that higher engineering way of getting the larger engineering sense of things." G. M. Butler argued that for most cases a careful check of an applicant's training and record should be enough to determine his fitness. The examination, then, would be required only of those doubtful cases. The Council was a long way from being able to require all candidates to pass an examination, and this was mostly due to the large number of distinguished older engineers who simply refused to take the test.

The state courts continued to support the principle of registration. In California, for instance, George A. Steele, who was appointed City Engineer without being registered, was taken to court. Since he had hired registered engineers to do the actual engineering work, the court ruled that he could keep his job as an administrator but could not practice engineering. In Florida, the court ruled that George T. Ward could not hold the office of County Surveyor even though he was elected. The reason for the ruling was that he was performing duties that could be legally carried out only by a registered surveyor.

Finances a Pressing Issue

The delegates continued to debate one of the most pressing issues that the Council faced—finances. Because the Council was comprised merely of a loose federation of states, it could not bill the states for the important services it provided. Instead, it had to rely on the good will of its members for its finances. The Boards themselves had many problems. The new ones had not yet collected any registration fees and therefore had no money to contribute. Some states, New York being the notable example, did not empower the Boards to use the money collected. Instead, it went into the general fund, and any money the Board could get had to be allocated by a separate agency.

There was also some argument among states about how much each should pay. Should a small state with a few hundred registered engineers pay the same amount as New York, with thousands? Some delegates felt that the fee should be tied to the number of registered engineers, while other states felt that all states, since they all received the same benefits, should pay the same fixed amount.

Finally, after much debate, a compromise was struck. All states must pay a $25 minimum fee. The fee itself was to be determined by a complicated system based on the number of registrants. When the annual renewal fee was $4 or less, the Boards should pay 10 cents per registrant up to 500 and 5 cents per registrant over that number. If the annual renewal fee was $5 or more, the Boards would be assessed 10 cents per registrant up to 3,000 registrants and 5 cents for any over that number. But the following sentence appears in the amendment: "If any Member Board cannot comply with the above requirement, it will be expected to pay as large a membership fee as its funds or legal restrictions will permit; the fee in such cases to be subject to the approval of the Board of Directors." In short, the amendment still allowed states considerable flexibility in their payment, and the Council was to continue to suffer financially for many years.

The Committee on the NBER reported that a problem developed because the State Boards of California and New York, two of the largest states, could not accept the Bureau's Certificates of Qualification. The problem developed because the Bureau's standards were less stringent than those of the states. The committee, therefore, suggested that Section 6 of Article III of the Council's Bylaws be changed to make it clearer that applicants needed to apply for a Certificate after obtaining official approval from the state unless the state had a law forbidding the acceptance of the documents.

The major problem was that holders of Class A Certificates, the highest rank, did not have to take an examination, although states like New York required them to do so. Class C, the lowest rank, met the requirements of the Model Law, but many states had developed laws more stringent than this one, which had become quite old. Class B was equal to the ECPD requirements, but again, some states had developed stricter standards. As several delegates pointed out, the Bureau, if it were to be truly useful, would have to develop standards higher than those of all states. Until this happened, the Bureau Certificates of Qualification would be useless in some of the most populous and important states.

Model Law Addressed

In 1937, one of the first items the Council addressed was approval of the new Model Law. The Council had always endorsed and approved earlier drafts of the law, which had been one of the most important items to come before the Council. In fact, the organization's entire thrust toward uniformity among State Boards was based on the Model Law approved by the Council and other engineering bodies. The law had been approved in principle by the Connecticut Board, the ASCE, and some other groups, but some members of the Council, most notably Steinman and Legaré, wanted changes made in it.

Steinman objected to the definition of professional engineering that appeared in the law. The law defined professional engineering by limiting it to the act of supervising a large number of engineers. Steinman argued, however, that this would allow only the men at the top to be considered professionals, even though consulting engineers and many other engineers actually function as professional engineers. A professional engineer, according to Steinman, did not need to be in charge of 10 or 20 men. The word "supervision" should appear below the basic definition as one of the enumerated examples of professional services. What Steinman and others supporting his argument feared was that his change would encourage unqualified individuals to practice under the supervision of a single registered engineer. This would defeat the purpose of the Council, which was to register all practicing engineers. President Dodds established a committee to reword the problematic section of

the law, and this group suggested that the Council not vote on matters at this convention but send the committee suggestions on wording that returned to that of the old law.

During the year, the ECPD had completed almost all of its work of accrediting engineering programs across the country. It completed two of the seven regions and finished 90 percent of the schools in the other five and compiled a list of 107 schools found worthy of accreditation. Sixty-six of these were accredited unconditionally, and of the remaining 41, one or more of the curricula had received provisional accrediting for one to three years. The ECPD had also worked out a permanent plan to keep track of changes in the approved schools. First, each spring a committee would send out a letter to the head of each engineering division asking for a statement of major changes in the program that might affect accreditation. Second, the committee would occasionally send out a detailed questionnaire to each school. Third, the committee could send inspectors to visit the schools whenever it seemed desirable. Although this system allowed schools an enormous amount of freedom to police themselves, the system did establish a permanent method for evaluating engineering programs.

The Committee on Uniform Examinations also reported on a questionnaire that it sent to the State Boards asking for information on their examinations. It became clear that the Boards still varied greatly in their procedures and methods. Few attempted to follow the outline for the uniform examination adopted by the Council several years before. But, as Steinman pointed out, progress was being made since 29 of 33 Boards were then giving written examinations while before few had any written tests. Also, most Boards were now willing to discuss the issue, and this gave the Council a broader base on which to develop a uniform system.

Progress was also being made in the area of enforcement. As the compiled data for the years show, the states investigated and prosecuted many complaints during the year. California in particular developed an effective method of enforcement largely because the Board had sufficient revenue to employ a permanent staff to support the secretary. Because of this, the Board could subscribe to trade journals and watch jobs in progress to see who submitted plans and specifications. Based on this evidence, the Board often initiated its own investigations. In complaints against nonregistrants, the Board had no jurisdiction and turned them over to the prosecuting officer, who cooperated with the Board and supported its work. In cases against registered engineers, however, the Board had direct jurisdiction, and it had revoked the licenses of about 30 engineers. Unfortunately, few Boards had this kind of system and support; California was the exception, not the rule.

The delegates also took up the question of the National Bureau of Engineering Registration again. The committee on this project framed a revised statement of the Bureau's purpose, and this elicited debate on several issues. Steinman returned to his previous objection that the Bureau should maintain standards higher than those in all states if its certificate was to be accepted nationally. This meant, therefore, that the Bureau's standards had to be more stringent than those outlined in the Model Law. The law had been a compromise between a number of national engineering societies, many of whom did not support enthusiastically the registration movement.

Another problem Steinman saw was that the committee's report avoided the problem of home-state registration. Before receiving a certificate from the Bureau, the applicant had to be registered in his own state. This ensured that the State Board retained their rightful control over registration since many state laws explicitly stated that this must be the case. Steinman's goal was to have the Bureau require an examination for classification A, college graduates with four years' experience; and classification B, examination plus eight years' experience.

Steinman also objected to the phrase, "who is exempted under an existing law," that allowed engineers who received certification due to some exemption to make use of the Bureau. Steinman argued that "exemption cannot make a man an engineer" and that the Bureau should not support this kind of individual who often was not trained to be an engineer.

Although the delegates supported Steinman's motion to strike out the words allowing exempted engineers to be certified by the Bureau, he lost on the issue of examinations. Legaré and other members of the Council supported the Model Law and the idea of states' rights. If a state had higher requirements than did the Bureau, the state would simply have to require the applicant to take additional steps to receive certification. For instance, if a certified engineer from a state that did not require an examination received Bureau certification and applied to New York for reciprocity, that individual would have to take New York's examination to meet its requirements. Part of Legaré's objection was the expense and difficulty of the Bureau's giving examinations across the country. But he did not seem to recognize that he was fighting against a principle that now seems obvious. In order to achieve uniformity across states, some method of examination had to be developed that would test all candidates fairly.

Evaluation of Experience Discussed

Another important issue raised for the first time in 1937 was the question of evaluating a candidate's experience. The Council had discussed examinations and had a uniform standard regarding character by requiring letters of reference, but it had not discussed the evaluation of professional experience. Too often, the Boards merely counted up the years of experience, but, as Dr. Charles F. Scott in his address before the ECPD had argued, that experience had to be evaluated in some way. In response to this, the ECPD requested that the Council look into this matter by ascertaining the kinds of experience the State Boards required and how they evaluated it. The Council therefore established a committee to conduct this survey.

The 1937 delegates also addressed the complicated issue of the relationship between land surveyors and professional engineers. Professor Paul Rice of the New Jersey Society of Professional Engineers and Surveyors addressed the body by arguing that land surveyors should be considered in the same general professional category as engineers. He suggested that all engineers be required to take at least one course in surveying, and this would help alleviate the problem of untrained engineers practicing surveying. Being a professor of surveying, one of his major interests was to strengthen surveying programs at colleges and universities. He recommended, for instance, the land surveyor's license be the same as the engineering license because this would force schools to give "more adequate and complete training in surveying." All students trained as engineers would also have a major concentration of courses in surveying. In terms of the Model Law, he suggested that the category of land surveyors be dropped, "hereby placing the practice of land surveying on a basis comparable in every respect to professional engineering." Finally, he recommended that new subjects of a broad nature such as ethics be introduced to broaden training of surveyors and engineers. These recommendations, President Dodds decided, should be published in the minutes so that the Member Boards could discuss them in 1938. This was an important issue, especially during the Depression years when many engineers, often poorly trained and prepared, found themselves functioning primarily as surveyors on government projects.

Council Incorporated as Eleemosynary Organization

A sign of the Council's steady growth is that it was incorporated as an eleemosynary organization in the state of South Carolina on March 28, 1938. Following the ECPD, this move protected its officers from being sued as individuals for their work in the Council. After years of steady growth, the organization now consisted of 40 legally constituted Boards with approximately 60,000 registered engineers and land surveyors. Although the Council continued to grow in strength and influence, Secretary Legaré still found it necessary to remind the delegates that the Council functioned as a clearinghouse and coordinating body to assist individual states in administering their individual laws.

By 1938, the effects of the ECPD's accreditation program began to be felt. As one would expect, some complaints surfaced about the ECPD's fairness, and several academic organizations formed committees to look into the question. Dr. Tigert, president of the University of Florida, was appointed chairman of a committee of college presidents, and the National Association of State Universities also established a committee to study the issue. Dean Joseph Weil, delegate from Florida, suggested that the Council itself investigate because he felt that the same standards were not being applied evenly across the country.

But many benefits grew from the accreditation program. President Graf of Oregon reported that in his school only Civil, Mechanical, and Electrical Engineering programs were provisionally accredited. Chemical was not, but this led directly to the funding of a new $450,000 chemistry building with new equipment. The University of Southern California was also, Graf had heard, getting an additional $25,000 for equipment for the Engineering School. What's more, the SPEE supported the program after sending representatives to meet with the heads of the various accreditation committees in the field. The SPEE concluded that only small, inevitable discrepancies existed in the system. As Charles F. Scott of Yale noted, the accreditation movement was the biggest thing that had happened in engineering education and was "one of the greatest achievements of this Council." In fact, because the list of schools was used by each State Board, the accreditation movement represented one of the Council's most successful attempts to achieve uniformity.

Committee on Qualifying Experience Reports

The Committee on Qualifying Experience, formed in 1937, made its first report in 1938. This was an important issue since the engineering profession, perhaps more than the other professions, required the new engineer, either graduate or nongraduate, to spend a considerable amount of time gaining professional experience. Although all Member Boards agreed on the importance of this experience, there existed no guidelines to make evaluation of it uniform.

The report took the first tentative steps toward establishing such guidelines and outlining the major issues related to this subject. It asserted, for instance, that the 4 to 12 years of experience Boards demanded of new engineers indicated better than other measures the potentially successful from the unsuccessful. It also indicated the novices'

> intellectual habits and attitudes, his methods of thinking and doing, his facility in combining theory and practice, his ability to handle new problems, to visualize and to plan, his capacity to develop as shown by the use he had made of opportunities for self-development.

This period of experience was so valuable that over the years many delegates to the Council had argued that experience along with references should be the primary criterion for evaluating applicants.

The major problem with evaluating experience, however, was that all experience was not of the same quality. The committee, therefore, argued that the experience must be broad in scope and progressively more demanding. In other words, the young engineer must work in a position requiring him to make decisions on his own rather than simply following the orders of others, and he must show steady advancement with each position making more demands on him. In short, the experience must "indicate competency to practice professional engineering," especially in the "application of engineering principles and theories" to various situations. To evaluate experience, therefore, the Boards cannot rely on titles alone. They must examine the scope of the projects, determine the judgment and discretion exercised, and discover the evidence of progressive responsibility. For the nongraduate, the Boards must ensure that the applicant had acquired scientific and theoretical knowledge in a different way by proving that he can, like the graduate, apply principles to practice.

For the first time, the Council had before it a clear statement that examinations and education alone could not determine whether an applicant could function as a professional engineer. Although this was implicit in the Model Law, the committee's report examined thoroughly the issue of experience and how to evaluate it. Furthermore, some legal support for the necessity of adequate experience existed. In Oklahoma, an applicant was denied a license on the grounds of inadequate experience. Upon losing in a lower court, he appealed to the state Supreme Court, which ruled against him on the grounds that part of his experience did not require the application of engineering principles and data.

One of the results of this report was that it became harder for the young engineer to gain the necessary experience in the allotted four-year period. Since jobs were scarce, many young engineers could find only work that required little original thinking—they worked on surveying crews, they laid pipe, they worked construction. To advance to positions of authority was difficult, so many new engineers had to spend more than the minimum four years (for graduates) to gain experience needed for registration in many states. To remedy this problem, delegates made suggestions. Some suggested that the young engineer set educational goals for himself through reading programs. More importantly, as Dr. Scott recognized, the national engineering societies and older engineers in general had to become more involved with their younger colleagues to encourage them to develop their abilities and to progress in their profession. To further this goal and to standardize methods of evaluating applicants' experience, the Council gave the committee permission to continue its work by surveying the practices of the State Boards.

The Committee on Uniform Examinations also gave its report. After surveying its work over the previous seven years, it concluded that not much concrete had been accomplished. Boards were not interested in standardizing their procedures. They had not supported the 1936 attempt to prepare a schedule of examinations following principles developed during 1931, 1932, and 1933, and this project died. The committee suggested that it send out another questionnaire to see if the Boards were interested in continuing this work. It recommended that the Boards might adopt a uniform examination on fundamentals and allow the Boards to design their own tests on the specialized areas of engineering.

In 1938, Professor Greaves-Walker, president of the Institute of Ceramic Engineers (ICE), addressed the Council for the second time. Since 1936 when he delivered his previous address, the ICE had been sanctioned by the ECPD as an official branch of engineering. Most important to the Council, A. F. Greaves-Walker reported that the ICE was the first national society to require registration for the grade of member. In light of this, he requested that the Member Boards make reference to ceramic engineering among the branches of engineering.

Because inadequate financing continued to plague the Council, earlier in the year President Graf appointed a special Committee on Activities and Finances to examine questions of policy and administration relative to financial matters. This committee recommended that a committee of seven be formed to investigate the feasibility of compiling and publishing a *National Directory of Registered Engineers and Handbook of Engineering Registration*. The committee apparently hoped that such a book could be sold to make money for the Council. The committee also recommended that the Constitution be amended to establish membership fees and to request that all states pay as much as they legally could so that the Council would not have to solicit funds from other organizations. The delegates passed an amendment to the Constitution that required each State Board to contribute to the Council based on membership fees of 10 cents, 5 cents, or 3 cents depending on their annual renewal fee and the number of registrants. The minimum that a Member Board could pay was $25.

After a period of sometimes acrimonious debate, the delegates had a mild and pleasant discussion of the National Bureau of Engineering Registration (NBER). Most of the problems and disagreements grew from the question of the relationship between this body and the State Boards. In the 1938 report, the Committee on the NBER made it clear that the Bureau now required that all Certificates of Qualification be sent to the State Boards for review and endorsement before Secretary Legaré granted final approval. Furthermore, all borderline and doubtful cases went before the Bureau Committee, which consisted of members of State Boards, before the Secretary acted. The issue of the Bureau giving examinations did not come up, perhaps because Steinman was not there. The Bureau, however, functioned smoothly, and there was no complaint from any applicant. In fact, one engineer reported that he used the certificate to become registered in 15 states. The delegates passed a motion to publish in the Year Book a complete list of all engineers certified by the Bureau and to keep that list up to date.

Enforcement Activities Double

The Committee on Legal Procedure, chaired by C. C. Knipmeyer, also had good news to report. Enforcement activities were double the number of the preceding year, and the engineering societies, which had not always supported the registration movement with enthusiasm, brought four times the number of complaints as they did the previous year. This indicated that the societies were becoming extremely active in upholding the registration law. In fact, George T. Seabury, secretary of the ASCE, wrote to his local sections requesting them to help uphold the registration laws in their states. As Knipmeyer pointed out, however, registration was still not uniform in all states across branches of engineering. In many states, for instance, mechanical, electrical, and chemical engineers were not required to register, and this lack of consistency retarded the progress of the Council's work.

One concern of the delegates during 1938 was with the plight of the young engineer. These young engineers were being exploited because of the tight job market and low pay due largely to the poor economy. Colleges and universities were not helping these people find jobs after graduation,

and the engineering societies were not offering much aid either. The ECPD helped somewhat through its activities, including the pamphlet "Engineering: A Career—A Culture." Although out of date, it helped young people assess the profession. This was a necessary activity since 40 percent of freshmen engineering students dropped out their freshman year. Several delegates suggested that a committee be formed to look into the problem, but nothing was done at this time. The Council, however, was aware of the problems of the young engineer and recognized that he had to be nurtured if the profession was to continue growing.

The Council also recognized those that served it well during the early years of its existence. In 1938 the Council established the Distinguished Service Certificate, and presented one to each of the following: L. M. Martin, C. T. Olmsted, Paul Doty, and P. H. Daggett.

In 1939 President Charles F. Scott could report some important advances in the registration movement. The American Institute of Electrical Engineers (AIEE) drafted and circulated a Modified Model Law. This was a breakthrough since this organization had never accepted registration in principle. Problems would develop later, however, because the proposed law was weaker than the Model Law already in effect. Other national societies were also supporting the registration movement. The ASCE recommended the formation of State Committees of Registration that would work to further the cause on the local level by supporting the work of the Boards. The American Institute of Consulting Engineers formed a Committee on National Registration.

The Council also began to reorganize its procedures to make them more streamlined. The complicated committee system, composed of six standing committees and almost as many ad hocs, had become fragmented and confused. The chairmen could not always meet with all of the other members, and the data and questionnaires coming in were often scattered about the country. In order to unify the procedure, the directors proposed that the Executive Secretary be the ex-officio Secretary of the Council's committees in order to coordinate their work and to compile and distribute data. The Council also began the publication of a news bulletin so that the Secretary could distribute information to members of the Council. This would allow the Secretary to keep members informed on a regular basis by replacing the cumbersome machinery of individual correspondence, which had gotten out of hand as the Council's activities had increased.

The question of reciprocity received considerable attention at the 1939 meeting. The committee on this subject filed a majority and minority report, the latter written by Steinman. The majority report made three recommendations to encourage reciprocity among states. First, it recommended that the National Bureau be used more widely by the various states. Second, it recommended that registrants graduating from fully accredited colleges be examined only for experience, not technical knowledge. Third, it recommended that the National Bureau inquire of State Boards as to their approval of applicants before investigating and certifying their records.

This report did little to tighten up or clarify the reciprocity procedure, so Steinman wrote a minority report. In it he returned to his consistent objection about the National Bureau. It did not provide or require written examinations of applicants, and this led to many problems because some states still did not require examinations of all normal candidates, that all states should require written examinations for first-time registrants, examinations were far from uniform among states that did require them, and some states had developed standards much higher than those of the Model Law. To remedy these problems, Steinman argued that the National Bureau should require written examinations as a standard requirement.

As the debate following the reports shows, the states still could not agree on universal reciprocity. Some states could not accept registered engineers from other states whose laws were not equal to their own. In New Mexico, for instance, the attorney general denied the Board the privilege of reciprocating with several neighboring states for this reason. Some tension existed between New York and Connecticut because New York's requirements were higher than its neighbor's. The National Bureau helped with this general issue, but as long as its standards were tied to those of the Model Law, which established initial, basic requirements only, it could not be as useful as many delegates would like.

Bureau Faces Problems

The report of the Committee on the National Bureau raised some of the problems the central agency faced. For instance, Legaré complained that he could not give definite answers to inquiries about which State Boards accepted the Bureau's certification. This gives an idea of the confusion that must have existed at the time. Engineers still could not understand why the Bureau did not simply certify any applicant registered by a State Board. This was because a person with the very minimum requirements, perhaps registered under the grandfather clause, could be certified by state. Other problems arose because of the lack of coordination between the states and the Bureau. Several engineers complained that after having letters of support filed with the Bureau, the State Boards would often write to the same references again. This created problems when the applicant was seeking registration in a number of states. Not only did this duplication waste time, it also alienated the letter writers from the engineer requesting their recommendation and support.

The 1939 convention also took up the issue of professional experience. The Model Law required this as did all of the State Boards, but nobody had determined exactly what constituted professional experience. After surveying the practice of the State Boards, the Committee on Qualifying Experience found considerable variation in procedure and requirements. For instance, it discovered that college graduates tended to be registered more readily than nongraduates, who were often placed in borderline categories for further investigation and often rejection. To bring order to this situation, the committee turned to a report of the Committee on Engineers' Salaries in *Civil Engineering*. In this report, the kinds of experience typical of civil engineers were divided into three categories. The first one included "all professions and duties which involve engineering work of least professional difficulty and responsibility." Work in this category would include field work and perhaps drafting which made few demands for originality. The second category included "all professions and duties which involve Civil Engineering work of intermediate responsibility." The third included "the duties which involve Civil Engineering work of a special professional difficulty and responsibility." The Committee on Qualifying Experience concluded that those applicants under Grade I, if their experience was to count toward registration, must prove that they had some latitude for individual action.

The committee listed several kinds of experience that was "sub-professional" or "borderline." In Civil Engineering, jobs such as instrumentman, rodman, inspector, land surveyor, draftsman, salesman, county highway worker, and others of a similar nature fell into this doubtful category. In Electrical Engineering, such jobs including sales work, electrical wiring, "tinkering with radio," or running an electrical business were also questionable in terms of registration. The Council agreed to continue the committee so that it could expand its work into all major fields of engineering.

The Committee on Legal Procedure reported that numerous complaints were brought by Board members, registered engineers, members of engineering societies, or non-engineers. It became clear,

though, that the committee report system was not an effective method for compiling information about these numerous complaints and the court cases that sometimes grew from them. Several delegates realized that the greatest problem that the Council faced grew from its lack of a full-time Secretary to keep track of legal developments. President Scott remarked that in addition to a full-time Secretary, the Council needed a staff that included a legal expert. But the issue always came down to finances. The big states, including New York and California, still could not, because of legal restrictions, pay their full annual assessment. Without adequate income, the Council would not be able to thoroughly examine the legal developments touching on the registration movement.

Uniform Exam Debated

Another issue that continued to be debated was that of the uniform examination. The committee on this question reported on its latest survey and found that State Boards still were not consistent about requiring examinations. Only 42 percent of all Boards reported required all candidates to take a written examination. Other Boards made the requirement more general, testing only certain types of candidates. Although the majority of the Boards were in favor of an outline of a standardized examination, they would not use it unless it was as good as or better than their own examinations. Furthermore, the Boards did not favor an outline common to all engineers; instead, they preferred that only half the test be common across all engineering specialties.

The committee made two important recommendations. First, they suggested that the outline approved in 1935 be recirculated so that it could function as a common element among the Boards. Second, it recommended that the Council establish an examination clearinghouse to which all Boards would send copies of their examinations. The committee would then edit these and compile a list of approved questions.

Under the direction of President Scott, the Council in 1939 made a change in its Bylaws in order to coordinate the efforts of the various committees investigating the requirements for registration. It established an umbrella organization, the Committee on Qualifications for Registration, that would have under it three subcommittees: Examinations, Interviews, and Qualifying Experience. Each of these three would report to a single chairman who would coordinate their efforts and findings. The goal of this major committee would be to determine the guidelines for evaluating the competency of applicants for registration.

In his President's report in 1940, A. C. Polk expressed his continued concern about the Council's limited finances. "The Council now operates," he writes, "on a very limited budget, when its widespread activities are taken into account.…It would seem that after 20 years of existence this Council should have worked out some more definite method of financing itself properly, and carrying out its legitimate activities." The ASCE had for several years contributed money to the Council, and in 1940 other organizations considered doing so too. The ASME was discussing the possibility, and the NSPE agreed to give the Council $100. Even with this help, though, the Council could not accomplish all of its goals. It could not contribute its share to the ECPD and had to rely on individual State Boards to contribute $750 to this valuable organization. Polk estimated that the Council would need at least $12,000 per year to meet its responsibilities. This was considerably more than the actual budget of between $7,000 and $8,000 that the Council had to work with in 1940. As Secretary Legaré wrote in his report, the Council had, over the 20 years of its existence, spent only $31,685.61, an average of $1,584 per year. This meant that the Council operated on a budget of only 4½ cents per registrant.

The budget of the Dominion Council of Professional Engineers, which was smaller and had to accomplish less, worked on an assessment of 45 cents per registrant. That Legaré could maintain his Columbia office, publish the annual yearbook and proceedings, publish five quarterly issues of the *Registration Bulletin*, and conduct all of the other business of the Council on an inadequate budget is a testimony to his dedication and administrative abilities.

The states too had their own nagging financial problems. In some of the largest states, the Boards did not control the moneys collected from registration fees. These funds went back into the general fund, leaving the Boards with no working capital. In 1940, three of the largest states—Texas, California, and Pennsylvania—did not have enough money to send delegates. In fact, in many states the delegates had to finance their own trips to attend the meetings. To help remedy this complicated problem, the Council established a committee to study these two connected issues.

Despite this gloomy financial state, the Council did have some good news. Legaré reported that the Colorado Board, which had withdrawn from the Council several years ago, renewed its membership in April 1940. Furthermore, registration legislation was pending in six more states as well as the District of Columbia.

The large Committee on Qualifications for Registration and its three subcommittees gave their report, bringing into clearer focus many of the issues relating to evaluating applicants. The Committee isolated six kinds of information and the means of securing them. Written applications gave the Boards vital statistics (age, residence, etc.); letters of reference gave information on education; exhibits of work provided insight into experience; personal interviews suggested character and attitude; oral examinations informed the Boards of the applicant's knowledge of engineering fundamentals and principles; and written examinations demonstrated the ability to apply principles to practical engineering problems. By combining all of these approaches, the Boards could gain a complete profile of each applicant.

"Rational Method" Developed

In terms of the examination, the subcommittees on this subject developed the idea of the "Rational Method." Pointing to the problem of asking questions so general that even nonengineers could answer them, the subcommittee suggested that the Boards frame examinations "which are so designed as to require for their passing a successful demonstration of the mental processes characteristic of professional engineering ability." Rather than asking questions that merely required candidates to memorize details, the test should require them to demonstrate mastery of patterns of thought and problem-solving strategies typical of successful engineers. Candidates should demonstrate that they possess an "engineering mind" in order to obtain a certificate. Furthermore, the subcommittee suggested that all candidates, with few exceptions, be required to take and pass such an examination and that the Council assume the leadership in establishing a uniform examination to recommend to the State Boards. Slowly the Council was moving to the recognition that a standardized and uniform examination would greatly strengthen the registration movement. All members of the subcommittee did not agree with this progressive stance. In his minority report, Carl L. Svensen tried to blunt this emphasis on uniformity by arguing for yet another survey of the individual practices of the various states. He also argued that the "philosophy which points to an examination of all applicants in all states should not be injected into the matter at this time."

The subcommittee on the interview attempted to clarify the purpose of this part of the screening process. They defined the interview as "a conference for the purpose of obtaining a competent opinion or estimate of the applicant's personality, general information and experience." While the written examination provided information about the candidate's technical knowledge, the interview told of his personal character, attitudes, and aptitudes. These personal habits and characteristics, the subcommittee argued, could only be determined by meeting the candidate individually. The problem with this method, though, remained that often the candidate wishing to register in many states still would have to travel to several individual Boards in order to acquire certification there. This caused quite a hardship for the busy professional.

The third concern of the umbrella committee was the nature of qualifying experience. Two subcommittees, one examining civil and the other mechanical engineering, reported. Although neither subcommittee presented a finished report, they did outline more clearly than previously the kind of experience the young graduate should have before being registered. First, it should be progressive, with the candidate not remaining in a minor position for four years. Second, it should require the application of engineering knowledge. Third, it should teach the candidate to design, supervise, operate, and superintend. Fourth, it should show a steady rise in salary above the entry level. In addition to these, the report on mechanical engineers suggested that the applicant must show self-improvement, proof of which might be subscriptions to professional journals, for instance. In addition, the young mechanical engineer should be a member of national engineering organizations and should show steady professional growth as he moved from job to job.

In response to these reports, the Council adopted a number of important motions that would guide it over the next few years. The Council decided to formulate a statement of the "fundamental requirements" that candidates must meet before being registered. Furthermore, the Committee on Qualifications for Registration should extend its work into all basic fields of engineering. It also approved the statement that the Council support the principle of uniform professional examinations for all candidates except those with extensive national reputations and that nongraduates and graduates from schools not approved by the ECPD be required to take more extensive tests. Also, the Committee on Qualifications for Registration was charged with selecting or preparing questions and problems in several fields to clarify and standardize the objectives of examinations. The Council also reaffirmed its belief that no single method of evaluating candidates was sufficient by itself and the Boards should use a number of different techniques for securing information. Furthermore, each of these methods should receive a definite weight in the overall evaluation.

To help improve the Council's finances, President Polk outlined a plan that the Council approved after some debate. Polk argued that the membership fees of Member Boards should be increased as much as possible. This fee increase was to be based entirely on the number of registrants in each state. A state with fewer than 500 registered engineers would pay only $50, but one with more than 5,000 would pay $300. This plan, though passed, angered some small states because a state like New York would pay much less per capita than the smaller states. The issue remained complicated by individual state laws that controlled Boards' finances in various ways. Polk also argued that the services of the National Bureau be extended so that it would bring in more money to the Council's general fund. He also suggested that all Boards interest engineers in subscribing to the various publications of the Council. Finally, he recommended that the Council continue to solicit contributions from the national engineering societies. While this plan did not solve all of the Council's financial difficulties, it was a move in the right direction.

Concepts of Interstate Practice Defined

The Committee on Reciprocity also gave an important report that defined for the first time some important concepts connected with the issues of interstate practice. First, it introduced the notion of "temporary practice." Under this, engineers registered in any state could practice in other states for at least 30 and preferably 60 days per year without securing registration. Also, states should allow the engineer who has filed for registration to continue to practice while the application was being processed. Second, the committee introduced the idea of "extended practice." Under this concept, registered engineers wishing to practice more than 30 or 60 days in a state should be treated in a way to minimize inconvenience, embarrassment, delay, and expense while securing registration. This concept was known in other professions as "Registration by Endorsement," and the committee outlined a method for handling these cases. Those applicants already certified by the National Bureau or by another state should be required to fill out a shortened application form and to pay a reduced application fee. Also, the personal interview should be eliminated due to the expense and inconvenience to the candidate. Furthermore, these candidates should not be required to retake written examinations if they had already taken them with another Board or through the National Bureau. These principles, the committee asserted, would form a new and sound basis for reciprocity, and the Council approved them with only one "no" vote.

The Council also learned from the 1940 report of the Committee on Legal Procedure that progress was made on the enforcement front. The number of cases of legal action the State Boards reported jumped from 161 the previous year to 602 during the latest reporting period. The committee concluded that, although Boards still differed in their approaches to this issue and their methods of operation, the enforcement activities showed "definite gains in vigor and accomplishment." This suggests that the concept of registration was steadily gaining the respect of the profession.

Another important issue that developed concerned the new "Model Law" for the registration of engineers and land surveyors that the AIEE had approved in 1939. This law was cast in direct competition with the Model Law that the Council and other major engineering groups had approved. The major difference between this new law and the old one rested on the issue of the registration of industrial engineers. The new law wished to excuse from registration all engineers "not for hire to the public and not in public employment." In his motion that the Council renounce this law, Steinman argued that such a loophole would set back progress in the registration movement by emasculating the law. Such changes would also, he noted, cause great public harm merely in allowing a small group of engineers to avoid the responsibility of becoming registered. The Council passed Steinman's motion without a dissenting vote.

Another indication of the Council's financial difficulties was its inability to compile and publish a directory and handbook of engineering registration. Such a book would perform the useful function of listing all registered engineers and provide various kinds of information about registration. It would also contain information from all individual Boards and would therefore offer another vehicle to help the Council strive for uniformity of practice. The delegates decided, however, to delay such a project until adequate funds were available.

One of the most interesting documents of the 1940 convention was the Report of the ECPD Committee on Professional Recognition that pointed out many of the idiosyncrasies of the engineering profession that directly and indirectly affected registration. Because of its history,

the engineering profession consisted of numerous loosely connected engineering organizations. The various engineering societies often worked not for the good of the profession but to achieve their own particular goals and interests. This fragmentation also spilled over into engineering education, which possessed, as someone observed, "an appalling lack of unity and coordination." No national system existed to coordinate all of this activity. Within this welter of conflicting organizations, the Council could perform important functions. The committee recommended, for instance, that the Council encourage the State Boards to place even more emphasis on "character, social motivation, and understanding and practice of professional ethics" in candidates for registration. By doing this, the Council would make a major contribution to elevating the engineer in the public's eye and helping engineers achieve greater public recognition.

World War II Begins to Affect Council

By 1941, the Council began to feel more sharply the effects of World War II. As President Virgil M. Palmer noted in his opening remarks to the Annual Meeting, engineers were becoming even more active in interstate projects than before as they worked on numerous war projects that sprang up across the nation. Many engineers had become dislocated and had to be quickly registered in several states other than their own. Such shifting, Palmer perceptively commented, would probably continue after the war, and this would make the work of the Council even more important.

Another result of the war was the marked increase in industrial accidents because projects were being hastily started, often without qualified engineers. Because properly qualified engineers were limited, the government and industry often ignored the legal requirements of registration. This state of affairs threatened to undermine much of the work that the Council had accomplished over the past 20 years.

The Council continued to work toward a uniform examination procedure. The survey of examination procedures conducted by the Subcommittee on Written Examinations demonstrated that much diversity still existed among the various State Boards. The Subcommittee on Interviews and Oral Examinations also discovered such diversity, but this subcommittee compiled a list of six recommended General Principles for conducting interviews. The interview, for instance, should follow the written examination and the preparation, by the Board members, of the particular objectives to be achieved by the interview. In general, these principles encouraged the Boards to make the interview substantive rather than superficial in order to prove the applicant's knowledge of engineering principles and practices.

The Subcommittee on Qualifying Experience produced a list of requirements engineers must meet in order to become registered. These reiterated principles the Council had enunciated earlier: that the four years of qualifying experience must be challenging enough to develop knowledge of engineering principles and professional judgment; that the experience must demonstrate progress in the assumption of responsibility; and that Boards should carefully examine the record of every candidate to determine if his experience proved that he was qualified to perform all aspects of engineering work.

The Committee on Qualifications for Registration made a number of recommendations that the Council passed. First the Council agreed to ask next year's Committee on Qualifications to propose a list of subjects to be covered by the examinations in order to move toward standardization. Second, the Council planned to determine, for all fields of engineering, specific criteria for qualifying experience (this had been done only in general terms so far). Third, the Council agreed that it should continue to work with other organizations to enact strong new registration laws and to

strengthen older ones. Fourth, the Council supported the use of written and oral examinations to establish proof of an applicant's abilities.

The Council continued to wrestle with the complex problems associated with interstate registration. Reciprocal registration still could not form the basis of interstate registration because standards were not uniform among the various states and their registration laws. The National Bureau of Engineering Registration provided such a basis, but its qualifying standards were no higher than those of any individual state. This was because it based its standards on the minimum requirements of the Model Law, while many states had adopted standards more stringent than those. Furthermore, the National Bureau's usefulness was undermined by its inability to administer written examinations. As it then stood, the Bureau could only check and certify education and experience. The third method of interstate registration, Registration by Endorsement, allowed State Boards to grant certification to applicants who were so clearly qualified that they could be exempted from taking the examination. While this procedure could work for some cases, it did not provide the uniform procedure for handling all cases of reciprocity.

Close ties remained between the Council and the ECPD because both organizations were concerned with the development of the professional engineer. Both organizations worked toward similar goals, including counseling engineering students, strengthening engineering curricula, and working for uniform requirements for registration. The Council agreed to support the ECPD in the preparation of materials to guide and support young engineers and engineering students.

Code of Ethics Needed

One issue that both organizations agreed on was the need for a short code of ethics that all engineers could agree to uphold. Some states, such as Texas, had a code printed on its application forms, and Steinman suggested that having applicants swear to uphold such an oath added weight and substance to professional registration.

By 1941, the Council could look back over its work and see some of its results in the form of the Committee on the Effects of Registration report. With the ECDP the Council had helped develop standards to accredit engineering curricula. It had also helped develop methods for individual engineers to improve themselves through courses of study geared to help engineers pass their examinations. The registration movement had established common ground among the various branches of the profession and had encouraged the individual engineer to see himself as a professional. As this professionalism developed, the public began to understand in more detail the nature and importance of engineering, distinguishing between the duties of the various trades and the professional responsibilities of the engineer. In addition, public agencies had begun to use the registration laws as a basis for employing competent engineers to work for the public good. In general, the registration movement, far from being selfish, had achieved one of its goals—to benefit the public by protecting its welfare. As H. S. Rogers, president of the Brooklyn Polytechnic Institute, commented:

> The social trust imposed upon examining boards and the obligation for the administration of engineering registration are not fully discharged when minimum standards of practice and ethics have been established. The delegation of this trust and the implicit obligation summon the entire profession to share in the expansion of the

> common store of knowledge, in the training and development of practitioners and in the ever-advancing improvement of the service and competency of the profession.

Although the Council still had much work to do, it had also accomplished much.

World War II Disrupts Council

World War II radically affected the engineering profession and the National Council of Engineering Examiners, just as it did all aspects of American life. Many engineers served in the war; moreover, many were employed in civil and military projects such as construction jobs connected with the war. Imbued with the same patriotism as other organizations during that period, the Council sent out the question to Member Boards, "How can the Council and Member Boards best serve the all-out war effort?"

1942 Meeting Cancelled

One manifestation of the disruption of the profession was the fact that no meeting was held in 1942. After Pearl Harbor, the next Annual Meeting was in October 1943, composed of a program which lasted only two days instead of the usual three or four.

As President C. C. Knipmeyer said in his address at the annual dinner, World War II was an "engineers' war." He continued, "The best equipment in the air, on the sea, and on the land battlefield is sure to win." Ironically, in this very humanistic address, Knipmeyer went on to predict that a new era in engineering progress would begin at war's end, through development of peacetime applications of wartime engineering developments. He called upon members of the profession to nurture a social-minded approach to their work by weighing human needs and values against purely technological developments.

Despite the war conditions, pressure of work, and difficulties of travel, a quorum of 33 of the 47 Member Boards was represented, prompting Secretary Legaré to call the attendance, "a remarkable record for these times." The Council carried on with business as usual, but the effects of the war are reflected throughout the 1943 *Proceedings*. A number of activities stand out, including, for instance, the development of a new status for registration, the Engineer-in-Training (EIT).

This new category was the Council's answer to the problem of young engineering graduates just out of college being forced into unions because they lacked professional standing—that is, legal registration as a member of a professional group. For instance, when a given firm's engineering department voted in a union, the young engineer would be forced to join if he was not registered. To protect him, the category of Engineer-in-Training was born. Not only did it shield him from the unions, it afforded him contact with older professionals in his field and with the views of organized groups of engineers.

A committee had been formed shortly after the 1941 meeting to study the issue of the EIT and to report to the 1943 meeting. That assignment was completed. The committee found, by investigating the various state laws, that in some states those laws would allow registration boards to adjust their procedure in order to register the EIT; other states would require an amendment to existing laws. Further, the committee suggested that the Council could serve as a clearinghouse of information for the individual State Boards. It was also suggested that as the membership in the EIT category grew over the years, the Council might properly establish a professional enrollment of junior engineers. The committee's report was approved by the Council.

Also concerned with the EIT movement, the Committee on Qualifications for Registration recommended that the Council request that the committee's 1944 successor propose a list of subjects to be covered, the time allowed, and the procedure for the portion of the professional exam provided for candidates for the EIT category for use by Boards having this classification or by Boards which might consider such a classification.

This was typical of the care with which the Council moved into a new area of activity. The procedures which it established worked well because the Council was cautious, making sure that its actions had sound rationales.

War Experience, Education Present Problem

Another problem the State Boards had to confront as a result of the war was the evaluation of war experience and war education. As Secretary Legaré said, he had seen "production engineers" during the war that "were not any more engineers than a June bug." He predicted that engineering Boards all over the country were going to have a problem resulting from men returning from the war seeking registration as engineers based on war experience and training. Not only did there have to be some plan to cope with these applicants, there had to be some way to finance the Boards' activities in connection with the problem. Legaré maintained that the various Boards were going to need the help of the Council in this situation.

In answer to the challenge, the Committee on Qualifications for Registration recommended, among others, two steps for Council's approval: (1) that the 1944 Committee on Qualifications for Registration, through its Subcommittee on Qualifying Experience, consider the matter of wartime experience in relation to registration as it might affect experience requirements in the postwar period; and (2) that the 1944 committee consider the matter of wartime engineering education in its various phases in relation to registration during the postwar period. Both of these recommendations were approved by the Council.

Over and above problems brought on by the war, continuing concerns of the Council had to be addressed. One of course was the Model Law. A conference of representatives of national engineering societies and the Council was held under the auspices of the Committee on Registration of Engineers of the American Society of Civil Engineers. At this time amendments were adopted by the group. The ASCE, which had been a leader in developing the Model Law, earlier had proposed a definition of the Engineer-in-Training, which was incorporated into the conference's revision.

A particularly interesting report at the 1943 convention pointed up the need for efficient reciprocity. This was the report of a survey done by the Committee on Interstate Registration (the name of which was changed during the Annual Meeting to the Committee on Reciprocal Registration). The committee had conducted a survey designed to obtain a sampling of the experiences and comments of engineers who had personally encountered problems, difficulties, and embarrassments in securing interstate registration. Replies in the form of completed questionnaires were received from 82 engineers holding an aggregate of 318 interstate registrations. Each of the respondents was registered in an average of four states (the record being held by one New York engineer who was registered in 40 states). Some of the members at the meeting felt that criticism to which they could not reply was unfair, while others felt that the criticism was healthy. The Council voted to receive—not approve—the report.

While the sample was not scientifically arrived at, it is useful to review the criticism, keeping in mind that two-thirds of the respondents noted that they had received "marked courtesy and consideration" in the states in which they had applied for interstate registration.

Following is a breakdown of the criticisms that were recorded in the survey: delay, 28; requirement of personal appearance, 27; preparation of the application, 23; annual renewal fee, 22; requirement of written exam, 18; furnishing of references, 15; verifying of education and experience, 13; and registration fee, 9. The committee made several recommendations concerning acceptance of Bureau certification which were designed to overcome obstacles in interstate registration.

By this time, the total number of Certificates of Qualification issued by the Registration Bureau since it was established was 541. A total of 49 had been rejected and 36 were pending. Since the 1941 Annual Meeting the Bureau had accepted for consideration 109 applications. Of those, 85 had been approved, 4 had been rejected, and 20 were pending.

During 1942 the National Bureau had received quite a number of applications from engineers entering military or governmental service. Some military and federal government departments advised candidates that they would be given preference and their applications would be greatly expedited if accompanied by a certificate showing that they were legally registered professional engineers.

Carnegie Foundation Funds Study

An important development in 1943 concerned the Engineers' Council for Professional Development. It was reported at its 10th annual meeting in October that the prestigious Carnegie Foundation had awarded it a $15,000 grant to study aptitude procedures. The grant would be used to determine factors to be considered in the selection of students to be admitted to engineering schools. This was a vote of confidence for the credibility of the ECPD.

As always, the Council had to deal with budgetary matters. The Committee on Supplementary Finances made the following statement in its 1943 report: "It would seem that this Council should have no difficulty in budgeting, fairly assessing, and collecting any reasonable amount of money for defraying the cost of any programs approved by representatives of the Member Boards." After the report, L. M. Martin of Iowa made a motion which contained the following comment: "…I believe we have outgrown the time when we could get along with just a part-time secretary. I believe we should do like other large organizations, put in a full-time secretary and really be progressive, the same as the Medicals are doing….We are lagging behind and aren't getting anywhere, and won't, as long as we don't really step out, really do things."

Thus, the Council's self-image seemed to be changing. From its modest beginnings in 1920, with a few Boards meeting to establish goals, it was now an effective body of professionals claiming membership of 47 legally constituted boards of registration for professional engineers, with a total of 255 individual Board Members. These Boards reported a total of 72,000 registrants. The Council was now associating itself with medicine, one of the oldest organized professional groups, and seeing itself as an instrument of leadership.

And well it should. With World War II yet to be won, the Council's job of guiding the profession through the conflict—the engineers' war—had just begun, and it would need all the cohesiveness it could inspire.

As the Council neared the end of its second era, it had to grapple with a fundamental question which had been a concern for a long time: what is a professional engineer?

Illinois Act Declared Unconstitutional

In Illinois, the act providing for the registration of all professional engineers in the state had been held to be constitutional by the State Supreme Court in 1944. The opinion of the judge was based

chiefly upon the contention that the definition of professional engineering as given in the Illinois Professional Engineering Act was vague and indefinite. The ruling was particularly significant because the definition, with the exception of a few words, was the same as the definition in the Model Law, and with slight variations, was contained in the engineering registration laws of 14 states.

The Council's executive secretary called the case "a direct challenge to the entire engineering profession," especially the Council and the national engineering societies that endorsed the Model Law, and called upon these groups to cooperate fully in determining what actions were to be taken regarding the original definition or the compiling of a new definition.

While this was a grave setback, the 1944 Annual Meeting offered a more positive note for the Council. This was the report of the Committee on the Effects of Registration. In 1941, leading State Board members had been asked to express what they considered to be the effects of registration, as observed in their own states. Their opinions were to include both "definite results established as facts, and intangible effects," largely a matter of judgment on the part of the Board Members. Twenty-six replies from 18 Board Members in 14 states turned up six categories in which positive effects could be observed: engineering education, individual development, professional consciousness and attitude, understanding on the part of the public, endorsement and acceptance by public agencies, and service to the public.

The committee now followed up its work in 1944 with a request that Board Members evaluate the findings of the 1941 survey. The committee reported that "overwhelming endorsement of the validity of the early report" was evidenced in 252 votes of approval (and only seven of disapproval) from the members responding in 1944. This report seemed to provide sound indication that the Council had unquestionably affected the profession positively. (Chairman Charles F. Scott was more emphatic, calling the establishment of the accrediting process, in cooperation with the ECPD, a "miracle.")

While the Model Law might be under attack in Illinois, that situation did not stop the Committee on the Engineers-in-Training from plunging ahead with its work on that category, which had been recognized when the Council had approved the latest revision in the Model Law. That revision addressed the EIT issue. The committee sought to achieve uniformity of regulations concerning the EIT in the various states when it resolved that its successor committee canvass State Boards to determine if uniformity of procedure could be achieved before too many states had "put the general program into operation upon divergent bases." The states had been moving ahead, and the Council discovered that various states were incorporating the program in one of two ways: (1) by amendment of basic laws, as was recommended by the Council in 1943; and (2) by revisions of rules or practices under existing laws.

Another registration issue which was coming to the fore at this time was the subject of continuing competence of registrants. This matter was broached for the first time by the 1944 Committee on Qualifications for Registration. The committee report cited an article in the *Registration Bulletin* which pointed out that because permission to practice is granted by each Board, never to be revoked except upon gross negligence, incompetence, fraud, or misconduct in the practice of professional engineering, it is therefore proper that qualifications for registration include reasonable assurance that the recipient of a certificate will remain competent throughout his practice. The Committee therefore raised the questions: Is there any method by which the Boards may have a reasonable assurance of continued competence, and is there a significant index of continued competence? Clearly, later committees would have to deal with these problems.

As the EIT had done in an earlier year, now a new category of certification confronted the Council: the graduate of the technical institute. Such an institute was defined as having a post-high-school program of technical character not on a professional level. It was comparable to a junior college with a two- or three-year program and was supported either by industry or private funds. It was recommended by the ECPD that programs of technical institutes be examined and that a list be made of those which met minimum standards of accreditation. It was understood that a certificate from these accredited technical institutes would not bear the word "engineering." This appeared to be a fair compromise, and it protected the integrity of the term which Council had sought to maintain since its inception.

Council Reaches a Turning Point

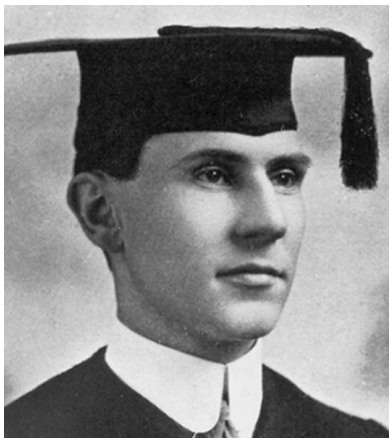
The Council had now reached a turning point. The report of the Committee on Supplementary Finances contains an interesting statement by Watts A. Shelly of Michigan, indicating that the organization had to make some decisions about future priorities. In discussing the proposed budget, Shelly recognized that it was the Council's mission to promote registration and professional engineering, but he called on the Council to "stick to the idea of a clearinghouse of registrants and let the profession carry it the rest of the way." Apparently Shelly was suggesting that the Council not expand its areas of interest.

However, Carl L. Svensen, in his address at the annual dinner in 1949, posed a number of interesting questions, one of them being, "What then is the place of the Council of the future?" Recognizing that one answer to that question might be one which Shelly offered, that the Council serve only as a clearinghouse of information and a unifying service, he nevertheless went on to suggest that a broader role might be possible—the correlating of the many elements of education, experience, ethics, and human relations.

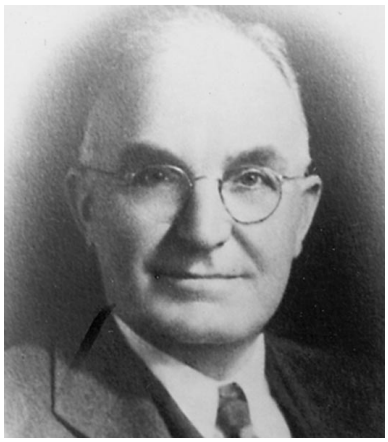
And while many members might see the role of the Council as merely a clearinghouse, its growth attested to the fact that it was a power to be reckoned with in the engineering profession. It had now grown to an organization of 48 state boards representing 75,000 registered engineers. For the first time, President Svensen and others were suggesting zone meetings between the Annual Meetings of the Council, with the assumption that such meetings would provide for a "greater, more active and more valuable participation of all Member Boards."

Clearly, with increases in both size and functions, the Council was coming of age. It had celebrated its silver anniversary on November 8, 1945, ironically without an Annual Meeting, which the "engineers' war" had prevented. During its quarter century of activity, it had accomplished much. Many of the member states had laws based upon the Council's Model Law which it had first proposed in 1929. The numerous requests for services of the Registration Bureau were concrete evidence of its value to the profession. The Information Bureau fulfilled an obvious need, as evidenced by the number of inquiries it received daily. Further, the Engineer-in-Training program was answering the need outlined in the 1930 *Proceedings* for a well-defined program of development for the engineering student. By all measures, it appeared that the Council was fulfilling its constitutional mandate to promote the public welfare by improving professional engineering standards.

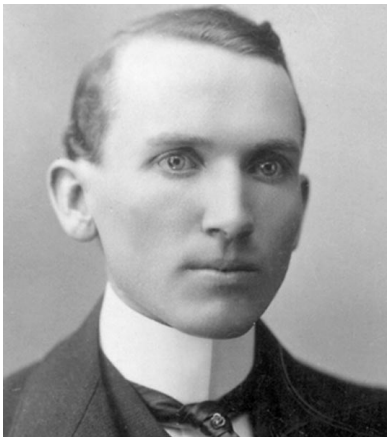
Paul Doty
Minnesota
1926–1927



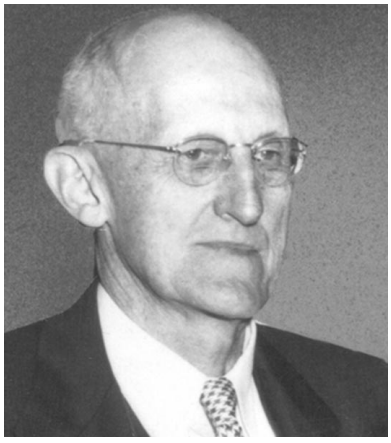
George E. Taylor
West Virginia
1927–1928



James R. Rhyne
Arkansas
1928–1929



C. G. Massie
Virginia
1929–1930



T. Keith Legaré
South Carolina
1930–1931

D. B. Steinman
New York
1931–1932

O. Laugaard
Oregon
1932–1933

N. W. Dougherty
Tennessee
1933–1934

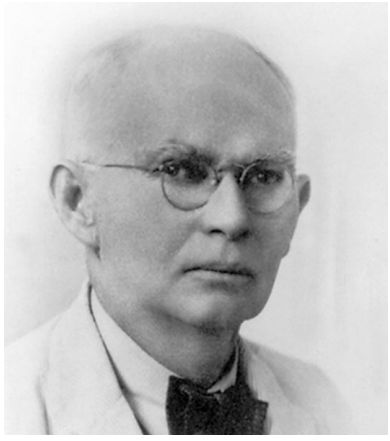
Ralph J. Reed
California
1934–1935

James L. Ferebee
Wisconsin
1935–1936

J. S. Dodds
Iowa
1936–1937

S. H. Graf
Oregon
1937–1938

Charles F. Scott
Connecticut
1938–1939

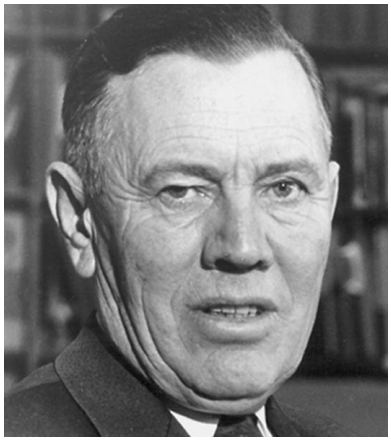


A. C. Polk
Alabama
1939–1940

Virgil M. Palmer
New York
1940–1941

C. C. Knipmeyer
Indiana
1941–1943

Carl Svensen
Texas
1943–1944



H. T. Person
Wyoming
1944–1946

CHAPTER 3
The Post-War Years
1946–1959

The year 1946 began the Council's third era as well as its second quarter century; this date was not merely an arbitrary division of its history. A number of developments marked the beginning of a new period.

First of all, its Constitution was undergoing revisions. Following a directive from the 1944 Annual Meeting, the officers and directors studied the Constitution and Bylaws and prepared amendments to state more clearly the objectives and to outline more clearly the activities of the various committees. Moreover, one of the proposed amendments would allow the Council to change its schedule of fees from State Boards in order to finance its expanded activities. Another indication of the Council's growth was the fact that the position of Executive Secretary was made a full-time position.

There were other evidences of the Council's growing role and influence in the engineering profession. Its revised Model Law was approved by virtually all of the professional engineering societies. The Dominion Council for Professional Engineers stated that it would recommend that appropriate features of the revised law be adopted to promote the greatest possible uniformity throughout the United States and Canada. The revision dealt with, among other issues, legal definitions of "professional engineer" and "practice of engineering," as well as establishing the Engineer-in-Training classification.

It was further resolved at the 1946 meeting that "upon proper application being made by anyone desiring to practice in another state and provided said application shows the basis of original registration as being not less than that required by the state in which registration is desired, then said State Board should grant said application without further requirements." This recommendation was accepted by a majority of the State Boards.

A part of the Council's expanded role was dictated by the growth of labor unions in this country and by the passage of the Wagner Act, which sometimes had the effect of forcing engineers into labor unions. Professional employees were subject to the provisions of the act if they were not in the category of management or certain other categories which exempted them from being classified as labor. There were two major responses to the labor threat on the part of the engineering profession. One was the growth of organized associations or guilds of professional engineering employees which were successful in preventing the forced inclusion of professional engineers in labor organizations.

The other major response to the threat of the labor movement was the Engineer-in-Training category of registration, aimed at giving the new graduate a sense of belonging and directing him away from the technical fields. This category was included in the Model Law adopted in 1946 by the Council. The report of the Committee on the Engineer-in-Training conducted a survey of State Boards and learned that six states had initiated the category. The Committee reported that it appeared that considerable progress was being made in "its becoming a regular practice of the Boards…" and that as the category demonstrated its usefulness, more of the states would adopt it.

An ancillary development in the growth of the Council which was related to the labor movement was the fact that the profession was becoming more aware of its public image. For instance, it was hopeful of securing public support in seeking favorable labor legislation. This awareness turns up in the report of the Engineers' Council for Professional Development and in the address at the annual banquet by W. W. Horner, president of the American Society of Civil Engineers.

Another historical force besides the labor movement which was shaping the Council was the continuing influence of the war. One of the primary problems with which the Council had to deal was that of evaluating military experience and education. Concerning experience, the Subcommittee on Qualifying Experience stated that the criterion for evaluating an applicant's record would be that the experience and subsequent study should have developed him so that he was "better prepared to undertake and complete a professional engineering task" than he was at the time of graduation from an engineering college or at the time he obtained his fundamental education. The Committee recognized that war experience might have been in foreign countries where construction and other kinds of engineering projects were involved primarily for the prosecution of the war and suggested that the frequent use of the interview method might help in judging such experience.

Another problem involving the military was that engineering schools were being pressured to accept service courses in military and naval science as a substitute for engineering courses with the object of permitting a prospective engineering graduate to qualify for both a commission and a bachelor's degree in engineering. As a result, the Council approved a statement by the Committee on Qualifications for Registration to the effect that this substitution for the "basic, technical, or so-called humanistic-social content in our engineering curriculum should be condemned."

The Council also had to deal with ongoing concerns not unique to the time period. The *Digest of State Laws Governing the Practice of Engineering with Procedures of State Boards* needed to be brought up to date and republished. The report of the Executive Secretary called on Member Boards to assume the responsibility for having their offices furnish information that would be required from each state. The Executive Secretary also urged the professional societies that it "seemed entirely fitting" that they contribute financially to the Council, reminding them that if it were not for the Council, these societies would have to handle various inquiries and problems independently.

Joint Committee Formed with NSPE

A joint committee of the Council and the National Society of Professional Engineers was formed earlier in the year to study matters of mutual interest such as the EIT, improvement of registration laws, etc. Some of the Council members objected to this alignment, which singled out one committee that would cut across other committees and might have duplicated their work. The result was that a proposed Constitutional amendment retitled the proposed Joint Committee on NCSBEE-NSPE as the Committee on Society Coordination. This committee was delegated the purpose of maintaining contacts with engineering societies interested in registration and studying with them and reporting on matters of common interest not within the duties stated for other committees. This amendment seemed to establish the Council's determination not to align itself with any one single organization at the expense of slighting others. It was felt by some members that such an alliance would result in a discredit to the Council in the eyes of the public and the profession.

The Engineers' Council for Professional Development reported that a number of aptitude-testing procedures were planned or were already in use at various levels of education ranging from high school through the senior year of college. This was a continuation of the program begun with Carnegie funds a few years earlier, aimed at redirecting those students poorly qualified for the engineering curriculum. The committee also called for greater professional unity, less specialization in college, greater professional consciousness, and a conscious effort to promote public acceptance of engineering as a profession.

The Committee on Registration by Endorsement submitted a number of statements to the Council, most aimed at overcoming the barriers to interstate practice by qualified professional engineers. The Committee recommended that all nuisance elements be minimized, any aspect of arbitrariness be avoided, and all possible friendliness, courtesy, and consideration be emphasized. These recommendations were a positive response to the earlier survey which revealed dissatisfaction on the part of about a third of the applicants for interstate registration. By the time that the Council convened for the banquet at its 1946 meeting, the organization had grown to embrace 50 legally constituted Boards of Registration, including all states and territories that had laws governing the practice of engineering. These Member Boards had a total of 278 legally appointed members and reported a total of more than 103,000 engineers. The number of applications to the National Bureau had almost quadrupled in 5 years, and cash receipts in the last 12 months had doubled those of the preceding year. The Council's proposed budget for the coming year showed an increase of 40 percent, and three new committees had been added since the 1944 meeting.

Clearly, the Council was an example of Ilya Prigogine's Nobel-Prize-winning concept of a "dissipative structure."

A number of new trends emphasized the early period of the third era of the Council.

Zone Meetings Initiated

One of these new trends, presumably an outgrowth of the size which the Council had assumed, was the initiation of the Zone Meeting. By the time of the 1947 Annual Meeting, all four zones were meeting individually, and their conclusion about the efficacy of the procedure was unanimous: the small, informal meetings were highly productive, facilitating a fruitful exchange of ideas relating to common problems, and should be continued. (Another interesting recommendation, which grew from the Central Zone, was that the Council become self-supporting. Frank E. Cave of North Dakota said, "…if the Council is worthwhile, we believe that the Member Boards should support it to such an extent that it is independent financially.")

During 1947, the Committee on Uniform Laws and Procedures conducted a survey to study procedures of the various State Boards; approximately 90 percent of those states having registration laws (43 of 48) responded. Of the Boards responding, 27 said that their laws conformed to the Model Law. There was a wide variation in the application of written exams. Fourteen of the 43 states replying required an exam in fundamentals, while 20 required it in professional practice. Only eight Boards required a personal appearance for graduate applicants. Eleven states had reciprocal agreements with other states. Twenty-seven State Boards accepted the Certificate of Qualifications for Registration as a Professional Engineer. Based on their responses, the committee made the following recommendations:

1. Oral examinations should be optional to the Boards.

2. The young graduate should be allowed to take part of his examination, preferably written, upon graduation.

3. Requirements for the National Council Certification of Qualifications should be strengthened.

4. The minimum requirements of the Model Law should not be changed at this time.

Many Boards were in transition, and the committee felt that some stability should be achieved before Model Law changes were made. The committee reported, "The war period has served almost as a cutoff in the process of registration. An excellent opportunity is afforded for the application of new and possibly more uniform standards of requirements for engineering registration." Curricula were being revised to meet the requirements of modern science and industry.

The Committee on Engineers-in-Training also conducted a survey of Member Boards to determine the status of that program. Replies indicated that 17 states, representing 64.3 percent of all registered professional engineers, had initiated the provision, while 9 of the 28 states not having the program were considering adoption.

Because the program was still in the development stage, the committee made specific recommendations to focus attention on important issues for those Boards which had not already formulated policies. These recommendations were (summarized): (1) that the EIT certificate be awarded on the basis of education, experience, and a written exam; (2) that the Boards should strive for close cooperation with the accredited engineering schools in their states; and (3) that the applicant for registration as a professional engineer should be credited with that part of the registration exam covered in the EIT certification. The committee further recommended that fees be as small as possible and that Member Boards grant reciprocity where qualifications were substantially equivalent. At this committee presentation, a new concept arose—that of refresher courses for persons preparing for the exam for Professional Engineer or Engineer-in-Training. Such courses might be provided for the engineering senior preparing to take the EIT exam; likewise, they were offered by professional societies as an aid to older men who had been out of college for some time but who were interested in registration. These courses might well be considered the prototype of continuing education in the engineering profession.

During the discussion of the report of the Committee on Engineers-in-Training, there arose another concept, that of national exams for EITs. It was brought out in the discussion that engineering schools are concerned with two kinds of students, those intending to become professional engineers and others. Dean Joseph Weil of Florida pointed out that the best way to distinguish between the two groups was to test their knowledge of material required of the professional engineer. He suggested a national exam similar to those used by the medical profession to test the candidate's proficiency. This test would not be binding upon State Boards. Instead, the Boards would have it available if they wished to use it. While the suggestion seemed reasonable, some members objected to such standardization.

At this meeting there was also introduced the idea that the degree in associate engineering could be offered contemporaneously with regular engineering curricula for those persons not planning to become professional engineers. This appeared to be a possible new solution to the problem of engineering schools having to serve a number of constituencies. Moreover, the concept of a national exam appeared to be a reasonable solution to the problem of the young, mobile engineering graduate.

Barriers to International Practice Studied

The Council during this period was faced with yet another new challenge which testified to its expanding scope. The Committee on Registration by Endorsement had as its mission to

eliminate or minimize barriers to interstate registration. This committee was now asked to study the similar and related problem of eliminating or minimizing barriers to international practice; and the idea of "One World—One Profession" was held up to engineers in other countries, especially Canada and Latin America. The committee had studied the barriers which confronted engineers desiring to practice in other countries temporarily. Among the requirements facing these engineers were those of (1) citizenship, (2) established residence, (3) graduation from a local national university, (4) passing an exam in a foreign language, (5) exorbitant and arbitrary fees, and several others indicating the magnitude of the problem. The committee also found that state and federal regulations in this country were barriers to international practice.

D. B. Steinman's committee stated that in reciprocity in professional engineering, "The only satisfactory rule is the Golden Rule," and proposed that this country's laws serve as a model for other countries. This committee recommended, among other steps, that (1) through embassies, consulates, and the Council, information should be gathered on provisions here and abroad concerning international practice of engineering; and (2) that the Council communicate with professional engineering societies and educators in other countries to formulate a joint effort at eliminating barriers to international practice.

While the Council had cooperated actively with Canada's Dominion Council for many years and had aided the profession in other countries through its Information Bureau, this proposal by the Committee on Registration by Endorsement marked a concentrated, large-scale effort to promote international reciprocity. The Council had indeed expanded its horizons.

The Committee on Qualifications for Registration, summarizing the progress that had been made over the years, presented seven recommendations, two of which were forerunners of important qualifications which eventually were refined and adopted after a number of years. The first was that the 1947–48 Subcommittee on Written Examinations prepare typical written examinations covering (1) fundamentals and (2) the major engineering fields. The committee felt that such a typical examination would serve as a guide to members of State Boards in preparing examinations and would bring about uniformity in the kind and degree of difficulty of the examinations given by the various State Boards. The second important recommendation was that graduates of approved engineering colleges not be exempt from the written exam. The committee expressed the belief that the most reliable way to determine whether a young man had grown technically or professionally during the period in which he obtained the required statutory experience was by a written examination. The experience of many State Boards supported that view.

At the 1947 Annual Meeting the Executive Secretary reported that the Council had a membership of 51 legally constituted Boards, including all 48 states along with Alaska, Hawaii, and Puerto Rico. It was estimated that there were approximately 110,000 registered engineers in good standing in the United States and its possessions. Thus at the end of its 26th year, the Council could say that it virtually encompassed the engineering profession in this country and had begun to turn toward new horizons.

"Dreams Come True"

At the Annual Meeting of the Council in 1948, T. Keith Legaré, completing his 25th year of service as Executive Secretary of the organization, recounted a number of achievements in a section of his annual report titled "Dreams Come True." Legaré's insights are invaluable in understanding the history of the Council.

When the Council was first organized in 1920, there were only a few scattered states with registration laws. At the time of Legaré's report, the whole country was covered by statutory requirements for the practice of engineering, except for the District of Columbia, where a relevant bill was pending.

There were more intangible developments, according to Legaré. He pointed out that at one time some national engineering societies were either actually opposed to registration or indifferent to its progress. Most of the major societies were now supporting the Council, and all engineering societies were greatly interested in registration.

Moreover, while at one time many of the engineering educators were definitely opposed to the registration program, Legaré reported that now most of the outstanding educators were cooperating in this major work and were particularly interested in the EIT program.

Concluded Legaré: "…we no longer have to read articles or listen to addresses by those who never really understood the true purpose and value of registration."

Perhaps one of the more dramatic advances of the Council was the EIT. Pointing out that while at one time young engineering graduates were ignorant of the requirements and procedure of registration, and that no effort was made to prepare them for this step, Legaré said that now the Council had reached the point that there was enthusiastic support of the Engineer-in-Training program and that pamphlets were available providing information for engineering students.

Legaré concluded in his 1948 report:

> For a number of years the progress of the Council was greatly handicapped by misunderstanding, disagreements, arbitrary attitudes, and lack of intelligent foresight regarding the development of this organization. *The functions of the Council now seem to have the wholehearted support of most of the Member Boards, engineering societies, engineering colleges, and others concerned.*

Council's Financial Position Improves

Particularly significant support of Legaré's optimism was the fact that the Council was in better financial condition than ever before. In 1923, the Council was indebted to State Boards for $357.30, and cash on hand was $30.10. As of 1948, cash on hand was more than $10,000, with a reserve of more than $3,000 and no outstanding unpaid accounts. Most of the Member Boards were paying their membership fees in accordance with the official schedule.

An interesting statistic indicating the effect of the Council was that for the first time the number of candidates for Engineer-in-Training exceeded the number of professional engineer candidates. Approximately half of the states had EIT programs, as compared to 17 the year before. It was hoped that a desirable pattern had been established whereby future professional engineer candidates would voluntarily obtain their EIT certification soon after graduation. Without question, they were becoming "registration conscious."

By this time the publications of the Council played an indispensable role in the organization. The *Registration Bulletin*, published quarterly, had a regular mailing list of about 1,000. The *Proceedings & Yearbook*, extremely well written and edited, served as the paper of record. Demand had been extensive for copies of the *Digest of State Laws Governing the Practice of Engineering and Land Surveying* and for the *State Board Procedures*. Of considerable use was the pamphlet

containing General Information on Legal Registration on Licensing of Professional Engineers. All indications were that the Council was serving faithfully in one of its avowed roles: a "clearinghouse of information."

By the time of the 27th Annual Meeting, it was estimated that there were now 125,000 registered engineers in good standing in the United States and its possessions. Moreover, the National Bureau of Engineering Registration was attempting to raise the standards for the Certificate of Qualification so that it would be accepted by all states.

Clearly, the Council was fulfilling its constitutional mandate laid out in Article II.

> …to promote the public welfare by improving professional engineering standards through efficient administration of State Engineering Registration laws, by facilitating interstate registration of engineers, and by defining and maintaining national qualifications for registration.

During 1949, a great deal of information and statistics resulting from committee activity was submitted to the President concerning continuing functions of the Council. The committees were the core of the Council, and the care with which they studied and reported on issues was certainly one of the factors which had led to the outstanding success of the organization.

The Committee on the Effects of Registration, which earlier had surveyed Member Boards, now surveyed practicing engineers through their professional societies to obtain their views of professional registration laws. The conclusions of the 1949 committee were based on 73 units of engineering organizations in 28 states and one territory. The responses were positive, as had been the earlier surveys of State Boards, but were more frequently qualified. The most frequent criticism was lack of enforcement.

Nevertheless, attitudes of the respondents supported registration. The prevailing opinions were (1) registration was raising the standard of engineering practice and rendering a better service to the public; (2) attention of the engineer was being focused on the profession and binding all technical branches of engineering closer together; (3) the technical development of the engineer was being improved because of registration requirements, and (4) far-reaching improvement was due to accrediting initiated by State Boards and the ECPD.

During the year the Committee on Uniform Laws and Procedures followed up work begun the year before, assembling and analyzing information regarding the responsibility for enforcement of the registration law in each state. Replies were received from all Member Boards. The committee report in the *Proceedings* states:

> A study of the results indicate that responsibility for enforcement of the law, in case of law violations rests upon 24 of the respective Member Boards. Twenty-six of the Member Boards have funds available for prosecution of law violations. Organized Groups of Professional Engineers in 40 of the member areas concern themselves, to varying extents, with law violations. No court convictions have been secured for violation of the law in 37 of the states, and in most instances no cases have been taken to court. In most instances, it is evident that compliance with the law is secured without necessity for court action, through the work of the respective Boards and cooperating societies or other agencies. Apparently, in cases taken to court, satisfactory verdicts have been seen secured in most instances.

The Subcommittee on Written Examinations reviewed questions used on written exams in a number of states. The committee found that there were wide differences in both the type of questions asked and in the difficulty of the questions asked. On the other hand, it was found that there were marked similarities in questions, in some cases identical to questions on other state exams to ensure at least approximate parity with requirements of states with older laws. The subcommittee found that absolute uniformity throughout the entire country was "not possible and not necessarily desirable since laws and needs varied throughout the country." However, it was felt that the Council should undertake to secure agreement among the states on the subjects to be covered in fundamental and professional areas. It was further stated that the Council should secure expert advice on examinations and examination procedures from specialists in the field after gaining information on the theory and practice of examination procedures and subjects covered in both engineering fundamentals and professional aspects.

The subcommittee reported that its job was "far from finished." It did, however, in charging its successor committee to continue the work, broach a new problem which would confront the Council for some years. The committee charged its 1949–50 successor with, among other projects, the work of giving attention to what constitutes professional experience in some of the newer sub-branches of engineering, such as agricultural, traffic, industrial, fire protection, electronics, radio, safety, management, and physics engineering—some of these would not have been dreamed of by the small group which met in 1920 to form the Council.

The Committee on Registration by Endorsement recognized that while much progress had been made in perfecting the registration procedure, the only phase in which progress had not been creditable to the engineering profession was in facilitating interstate practice (an area which early opponents of registration foresaw as being a nuisance). The committee recognized the outstanding importance of this phase of registration and went so far as to claim that "that freedom of interstate practice, without unnecessary barriers and restrictions, is more important in engineering than in any other profession. Selfish restrictions, provincial attitudes, unreasonable requirements, embarrassing hurdles, exorbitant assessments, and expensive and time-consuming procedures must be eliminated."

Interstate Registration Practices Condemned

In summarizing a two-year survey, a tabulation of current requirements in the various states for "Registration by Endorsement Without Written Examinations" was appended to the committee report with "a feeling of deep disappointment." The committee condemned such interstate registration practices as exorbitant fees, insistence upon reciprocity agreements, insistence upon oral interviews, etc. The committee concluded by finding that all of the objectives and guiding principles of Registration by Endorsement could be accomplished by adopting two simple rules: (1) the waiving of written and oral examinations of the applicant who had passed a reasonably equivalent written examination in another state; and (2) the waiving of written and oral examinations in the case of registered engineers of long-established and recognized standing in the profession.

Committee Chairman D. B. Steinman, in a conclusion to the committee report, pointed out that the strongly worded report was intended to "stir State Boards from their complacent adherence to rooted attitudes and procedures…. As Member Boards of a Council, we must learn to visualize the problem from a *national* viewpoint. We are one profession, and we do not want to break it up into 48 mutually jealous and exclusive cliques." Dr. Steinman's concluding remarks

sum up the insightful document which he had been working on for 10 years and which urged removal of barriers to interstate registration.

The Committee on Engineers-in-Training reported that a questionnaire indicated that 19 State Boards had an Engineer-in-Training program in operation and had certified a total of 11,524 applicants. The committee now felt it appropriate to develop a "model" program which, if adopted by State Boards, would result in reasonably uniform standards and promote reciprocity. The model program included a written eight-hour exam, with 50 to 70 percent of the time devoted to the common basic subject matter of all engineering curricula, including math, chemistry, physics, engineering drawing, and engineering mechanics.

By 1949, two more "firsts" were observed by the Council. One was the interim Zone Meeting. Two of these were reported at the Annual Meeting—those held by the Central and Northeast Zones. Such interim meetings eventually became very productive in carrying out the Council's mission.

The second innovation was the State Boards Secretaries' Conference. The suggestion for such a conference came from the Arkansas Board, and one of its members, Robert J. Rhinehart, explained that "…we did feel that the secretaries were the workhorses for the Council and that it might be advantageous for the secretaries of the various Boards throughout the country to have a conference to talk over their common problems." Arrangements were to be made as to the time for such a conference at the next Annual Meeting.

By 1949, registration statistics revealed the success of the Council. At that time, there was a net gain in engineer registrants of nearly 20 percent over 1948 figures. Compared with data five years earlier, registration had more than doubled, with California accounting for a large part of the increase. The average increase over 1948 in engineer registration for all states except California was 6.3 percent compared with the growth of the entire engineering profession of 4.4 percent based on Bureau of Labor Statistics over the past eight years. These figures seemed to indicate a gain in registration with more than 150,000 registered engineers reported. The number of Engineers-in-Training certified at the time of reporting was 11,524. The office of the Council was receiving inquiries concerning registration from countries as far away as India, the Philippines, and Australia. (It is also of interest that the ECPD canons of ethics were adopted by a large number of engineering societies both in this country and Canada and were being translated for use in South America and Europe. An increasing number of consulting engineers had extended their practice to several states, and the issue of interstate registration was of increasing importance.)

Finally, the last political entity lacking registration legislation—the District of Columbia—appeared to be making progress toward such legislation, which was to be reported out of committee in the near future.

At the 1949 meeting, the president of the National Society of Professional Engineers, A. G. Stanford, stressed close cooperation between the State Boards and the professional engineering societies. He maintained that there was a definite need "for greater enforcement of our registration laws with regard to both illegal and unethical engineering practice among both nonlicensed and licensed engineers." Stanford went on to point out that the various state registration acts have many provisions—and lack of provisions—relative to violations and enforcement of the laws by the registration Boards. Some of these made it extremely difficult, if not impossible, for the registration Boards to thoroughly police or enforce their laws. The Boards had been forced to spend their time evaluating applications and awarding licenses rather than checking on those persons who did not apply for registration. Stanford urged that the same kind of cooperation be developed between the

engineering profession and State Boards as that which prevailed between other professions and their registration Boards. He proposed that programs between state chapters of NSPE and the State Boards be begun to study the conditions and problems in each state, to be followed by more realistic and effective administration and enforcement of the registration laws.

"Registration—A Dream Come True"

At the 1949 banquet, one of the most eminent engineers of this time, D. B. Steinman, addressed the Council on "Registration—A Dream Come True." (It is interesting to note that Keith Legaré must have been thinking along the same lines when he titled the preceding year's Executive-Secretary's report "Dreams Come True.")

"Those of us who have dedicated our lives to the [registration] movement feel richly repaid in the results achieved," Steinman said. He and others had fought to lay the foundation for a united and recognized profession because they believed that "a profession should be empowered to disown the unfit and the unprincipled who practice in its name." Steinman recounted that while the easy way of surrender would have been to break up the profession into branches and specialties, with different qualifications and separate licenses for each division, the Council had strenuously fought that. "Through our registration laws," he pointed out, "we have recorded the principle that engineering is one profession…." As had been done periodically in the past, engineering was compared to law and medicine, which "have as many specialties as engineering, but lawyers and doctors would never consent to the legal subdivisions of their profession." Steinman was adamant, concluding, "We do not want our profession pictured as a heterogeneous aggregation of trades and specialties."

Perhaps new challenges lay in wait for this philosophy which had united engineering, for in the same 1949 *Proceedings* which recorded Steinman's address, a supplement to the Report of the Subcommittee on Qualifying Experience listed 20 engineering specialties to be defined and considered in evaluating an applicant's experience.

National Council Celebrates Milestone

In September 1950, the Council celebrated a milestone: the President of the United States signed into law a bill providing for registration in the District of Columbia. Enactment of this law brought all of the United States into the fold. Secretary Legaré pointed out another factor indicating the stature of the Council: The U.S. Congress and 70 percent of the state legislatures had legally recognized the Council as a national agency by naming it, or one of its functions, the National Bureau of Engineering Registration, in legislative acts.

The work of the Subcommittee on Qualifying Experience during 1950 is a prime example of the meticulous thinking which went into Council decisions and guidance of the profession.

In July 1950, the Joint Cooperative Committee of the American Society of Civil Engineers and the Associated General Contractors of America had expressed the following principle: "When a graduate engineer is employed on construction, either by the Contractor, the Design Engineer, or the Owners, this experience shall be given credit when he applies for his personal license."

The increasing number of college graduates entering construction employ was making this question more important each year. The subcommittee was faced with the task of deciding what the term "construction" included. The group felt that the statement should be modified to mean that the construction experience should "be of a character that would qualify an applicant to practice

engineering independently." Their reasoning was that the basic principle underlying the practice of professional engineering is design. This meant that if a contractor executed work which had been designed by an architect or engineer, such activity did not necessarily increase the employee's knowledge of design to a degree that would justify its being considered "qualifying experience."

The subcommittee interpreted the 1949–50 *Yearbook*'s definition of construction as not including simply the execution of work as distinguished from "the planning or design thereof." Moreover, the *Digest of State Laws* of 1947 revealed that 32 states did not consider "work as a contractor" to be professional practice, and 19 states expressed no opinion.

Consequently, the Council adopted a resolution proposed by the subcommittee to the effect that work as a contractor be considered as qualifying experience when such experience involved responsible supervision of a character that expanded the engineering knowledge and skill of the applicant.

Another issue which had to be decided was how to evaluate graduates of technical institutes, a goodly number of which had been accredited in the last few years by the ECPD, whose Subcommittee on Accreditation of Technical Institutes fostered the movement. It was expected that the matter of experience concerning this type of graduate would arise in all states eventually.

The technical curriculum was already being offered by several universities as well as private schools and junior colleges. Such courses covered a considerable range of duration and subject matter, and while the curriculum did prepare the student for various technical positions, the programs were more limited than those required to prepare a person for a career as a professional engineer.

Such designations as engineering aid, technical aid, associate in engineering, and engineering associate were conferred on the graduates. These persons received good training in some technical aspects of engineering (in some instances, the regular engineering curriculum courses and the technical courses were taught by the same university faculty). The problem arose in deciding what experience was professional and what was subprofessional. Some Boards in the beginning of this period determined to give what was later called "an experience credit" based on the specific courses taken and the accreditation status of the school.

The Subcommittee on Written Examinations had been charged with investigating the possibility of securing professional assistance through the Educational Testing Service (ETS) in Princeton, New Jersey, in writing examinations. Eventually a contract was entered into with ETS for the administering of exams.

Registration Laws Mandated

At the 1947 Annual Meeting, the Committee on the Effects of Registration had been instructed to canvass practicing engineers through professional societies to obtain their views on engineering registration laws. Six items related to the effects of registration were covered: (1) on service to the public, (2) on legal recognition by the public, (3) on the attitude of the public toward engineering, (4) on professional consciousness and brotherhood, (5) on improvement in individual development, and (6) on engineering education. Replies came from 73 units in 28 states. The average of all replies to each item showed 50 favorable and 6 unfavorable.

That interview represented the viewpoints of engineers themselves; it seemed desirable to go outside the ranks of the profession for another appraisal of the effects of registration. Accordingly, a questionnaire was sent to personnel or employment departments of 277 organizations having large engineering staffs. A total of 174 replies were received, with the following breakdown:

Think registration is advantageous

1. To the public:	Yes, 137;	No, 12;	In doubt, 6
2. To your company:	Yes, 83;	No, 59;	In doubt, 5
3. To the engineering profession:	Yes, 131;	No, 13;	In doubt, 7

The response to (1) seemed to be a clear mandate for the registration process from nonengineers.

At the 1950 annual banquet, Dean N. W. Dougherty of the University of Tennessee, a longtime member and past president, delivered a stunning address on what the Council had become during its 30-year history. Included was a precise explanation of what the Council is:

> …a forum of free discussion and the exchange of ideas. None of its actions or recommendations can be binding on any state board; each state board is autonomous and must act under its own law and cannot delegate its necessary functions to any other agency. Boards can, however, use information and procedures suggested by other boards, they can cooperate with each other in gathering information, in exchanging ideas, and in getting uniformity. The Council is not a union whose majority actions are binding on all members; it is a loosely knit association for the benefit of all its members.

Dougherty recounted such remarkable achievements as the accreditation process, the Model Law, the National Bureau of Engineering Registration, and other activities of the National Council and concluded with understandable confidence, "This Council has done enough to justify its organization and support."

Unification Sought

By 1951, there were reportedly 117 societies, institutes, or other organized groups of engineers in the United States. The Committee on Society Coordination suggested that figure probably indicated a need for consolidation or more unification in the profession. The development of a national overall organization which would include in its membership all the qualified engineers in the several branches of the profession had been a subject of discussion for many years.

There had been no successful unification plan probably because the diversity of engineering specialties limited the number of problems which would attract unilateral interest from the profession on a national scale. (Coincidentally, the oldest engineering society in the country, the American Society of Civil Engineers, was to celebrate its l00th anniversary the next year with an international convocation and exposition.)

At this time there were at least three organizations working toward more unification of engineers along certain national lines: the Engineers' Council for Professional Development (ECPD), the National Society of Professional Engineers (NSPE), and the Engineers Joint Council (EJC). Four plans for greater professional unity of engineering societies were evolved by an exploratory group sponsored by EJC.

Plan A would expand the EJC to include a few additional widely representative societies. Plan B would further expand EJC to include top officers or representatives from all the societies in the exploratory group. Plan C would merge EJC and NSPE, with membership open to anyone meeting the basic membership grade for engineering societies, and Plan D would expand the NSPE and eliminate the EJC.

The Committee on Society Coordination called for suggestions concerning the role of the Council in promoting "unification" and solidarity of the engineering profession.

In any case, President Russell G. Warner reported that there was a sincere effort among the State Boards themselves to make their procedures more uniform and cited the success of the Zone Meeting in contributing to greater uniformity of procedures. Both the Northeast and the Southern Zones had initiated the interchange of examination papers with the expectation that a mutual knowledge among states would lead to uniformity in the scope of the exams.

Colonel W. M. Spann's Committee on Qualifications for Registration had prepared a syllabus of examinations to provide another tool for uniformity. The purpose of the syllabus was to serve as a framework to give equality in requirements for registration to facilitate exchange of reciprocal registration. The subcommittee submitted the syllabus to the membership of the Council for consideration and recommendation that "action be taken now."

At this time the Educational Testing Service recommended a tentative proposal regarding the "Development of Trial Objective Examinations," which would, according to ETS, provide "a ready means of increasing the numbers tested without requiring the services of professional engineers for examination grading." Cost reduction and uniformity of grading were the objectives. Thus two factors were critical in a time of growing numbers of engineering graduates. Questions for an experimental exam were to be submitted by a Council-appointed committee of professional engineers who would work closely with ETS, which would analyze the efficacy of the experimental exam. The committee recommended that Member Boards be canvassed as to interest and the possibility of contributing funds for a trial run for such a test. Obviously, financing this $10,000 project would be a problem.

The committee also recommended that since the proposed syllabus could become an "invaluable aid to all examining boards that have an interest in interstate registration," the subcommittee should study input received from the membership and suggest revisions for consideration at the next meeting.

In another move toward greater uniformity, 13 states in the past year had clarified and in most cases strengthened their registration laws, with many following the Council's Model Law.

Since 1931, many attempts had been made to create some uniformity in the type, quality, and quantity of exam questions. The general form of the exams had become reasonably well standardized. The 1951 report of the Subcommittee on Written Examinations directed attention to some of the weak spots in the questions and to making recommendations for correcting them.

The common practice among Boards was to give a two-day exam, the first day on engineering fundamentals (mathematics, physical sciences, etc.) and the second on application of knowledge and extent of experience. A canvass of Boards revealed that many Boards on the second day reverted from the practical questions back to the theoretical questions of the first day.

The committee recommended that the second day's questions be "based on knowledge gained from at least four years of practical experience in engineering, held to a level of thinking of an applicant having minimum acceptable qualifications."

The report of the Subcommittee on Qualifying Experience, during the 1951 Annual Meeting, culminated in their suggesting a survey of Member Boards asking for "full, constructive discussion of definitions of qualifying experience" as appearing in the 1949–1950 *Yearbook*. The problem of defining "qualifying experience" appeared to be growing more difficult as the engineering profession diversified more and more.

This report is particularly interesting because it discussed criteria used by the U.S. Civil Service Commission in evaluating applicants. The criteria in some instances sounded much like those used

by State Boards. For instance, they included: that the applicant's general record of employment be progressive and of increasing responsibilities, indicating more progressive use by the application of engineering principles; that the experience be true engineering work rather than that which could be performed by a highly trained technician or mechanic; and that the experience be not simply routine procedure with no regard to their limits or field of application or the theory involved in their development.

The subcommittee recognized that there was a wide divergence of opinion as to type, quantity, and quality of experience that should be considered as qualifying:

> The line of division between sub-professional and professional experience, to be recognized as qualifying experience, may vary considerably….It is extremely difficult to prescribe precise criteria whereby the qualifications of applicants can be measured and determination made as to their ability to perform professional engineering work….

The subcommittee also sent 300 questionnaires to widespread lists of manufacturers, consulting engineers, government and state agencies, contractors, and railroads.

Understandably, there was no doubt that a definition of "qualifying experience" was going to elude the Council for a long time. As well, there was no doubt that the Council was going to be totally scrupulous and relentless in pursuit of that elusive goal.

The Council was confronted with frustrating challenges, as are all similar organizations. Its *Registration Bulletin*, a useful publication sent to Council members and officials and committees of engineering organizations, was failing to attract submissions of articles. The Committee on Registration by Endorsement, still struggling with reciprocity, had been studying the policies and procedures developed by other legally regulated professions facing the same problem. The National Bureau of Engineering Registration had approved only 62 applications. The issue of endorsement was critical because more than any other profession, engineering is interstate in character. (A highly qualified member of the bar, by comparison, does not move from state to state.)

Nevertheless, the Council was forging ahead dramatically in its Constitutional goals.

Because of an innovation, the Council finished almost a full day early. This innovation was the Secretaries Council which began in 1951. This group met the day before Council began its formal meeting and stayed until almost midnight hashing out most of the business items that were going to be covered by the Council. Not only secretaries, but other Council members as well, attended the session, and many controversial points were cleared up before the regular meeting.

Engineers are nothing if not pragmatic.

Council's Self-Analysis

The year 1952 was a year of self-analysis for the Council. A special Committee on Evaluation of NCSBEE sent a letter to each member of each Board (300) inviting comments on procedures of the Council. Replies were received from one-third of the states, and the Committee reported that, "It appears that the present activities of the Council are generally approved." Four recommendations were made which affected the procedures of the Council:

1. That each of the standing committees review the reports of the last 20 years and summarize the most important findings as part of their next annual report;

2. That the Committee on Qualifications for Registration be discontinued and its three subcommittees (Written Examinations, Oral Examinations, and Qualifying Experience) be enlarged to full committees of at least five members each;

3. That the specific number of members of each committee be modified to permit assignment of a larger number of members when deemed desirable by the Board of Directors; and

4. That the program of the Annual Meeting be rearranged to provide a session for each of the new committees to meet and start its work for the coming year.

The Subcommittee on Written Examinations that year promoted the idea that an objective exam could determine factual knowledge of applicants but that a Syllabus of Examinations was essential before equivalent exams could be established among the various Boards. The subcommittee had submitted to the Council at the 1951 meeting a preliminary syllabus with the recommendation that it be studied by the membership and that suggestions for revisions be made to be considered at the 1952 meeting.

The subcommittee was disappointed that only three Member Boards offered suggestions and comments. For this reason the subcommittee recommended that the revision of the syllabus be referred to a special committee to be put in a more useful and acceptable form. The subcommittee felt that after the syllabus was perfected and accepted, an effort could then be made to see if it were possible to transfer the subject matter (particularly as it pertained to the EIT) to an objective format. The committee felt that a good, objective EIT exam could be prepared after the syllabus was perfected.

(The Central Zone had adopted a resolution to the effect that their zone should adopt the syllabus to be followed in conducting exams for the licensing of engineers, insofar as it did not interfere with the various laws and regulations of the states, so there did appear to be a decisive movement toward uniform exams, despite the fact that only three states had replied to the subcommittee's request for suggestions.)

The closer cooperation between the Written Examinations Committee and the EIT Committee came at a practical time since a substantial number of young men were applying for registration as professional engineers in states other than the states in which the EIT certificates were issued. The equivalence of the EIT exam to the examination administered by the Board to which application was being made was of concern to Member Boards, along with other factors. There were sharp differences of opinion concerning the desirability of having the EIT exam identical to the corresponding part of the exam required for registration of men who did not hold an EIT certificate. (Ten Boards reported that the EIT exam and the first-day portion of the registration exam were identical.) The EIT Committee concluded its report by recommending that the EIT Committee and the Written Examinations Subcommittee jointly study the problems during the next year.

Two other problems which confronted the Council at this time related to academics: (1) how to evaluate teaching as a qualifying experience for licensing; and (2) what a young man who wanted to enter the teaching profession should do with the pressure from college administrations for advanced degrees on the one hand and the demand of registration boards for professional experience prior to licensing on the other. A special committee was appointed to study "these twin problems," as President C. S. Crouse termed them.

R. A. Seaton's committee recommended that (1) State Boards require at least one year of the qualifying experience to be in some area other than advanced study, teaching, or research at a college or university and shall have been under the direction of a licensed professional engineer;

and (2) that university faculty members who teach engineering courses be, or be under the direct supervision of, registered or licensed engineers of at least one year's experience other than academics, and that such engineering experience be given equal recognition (in respect to advancement in rank and salary year for year up to at least two years) to the recognition given for graduate study leading to an advanced degree.

Also related to academics was the feeling on the part of some State Boards that ECPD might be accrediting curricula that may not have been, strictly speaking, engineering curricula. Crouse said that "tremendous pressure has been put on the Educational Committee by institutions granting degrees in these borderline classifications and the situation has just grown like Topsy." Crouse, in the ECPD Committee report, assured the Council that "something constructive and satisfactory to the State Boards will be accomplished in due time."

A number of procedural developments occurred at this period, indicating the growth and changing nature of the Council. A major development, the expansion of three essential subcommittees to full committees, has already been mentioned. In addition, Crouse appointed a special committee consisting of all active past presidents to give all Council members an opportunity to make suggestions, recommendations, or criticisms of the working of the Council "for the purpose of more nearly bringing our procedures to what you, as a whole, wanted." It was also recommended that the various members of the Council's Board of Directors be assigned to two or more committees each to act as general contact between the Board as a whole and the committees so that overlapping committee activities could be concluded. Also (in the first mention of the Secretaries' Conference to occur in the *Proceedings*) Secretary Legaré mentioned a new plan submitted to the Board of Directors to be used the next year: the Secretaries' Conference and the Zone Meetings would be held the first morning of the Annual Meeting before the first business session. This format has prevailed to the time of this writing.

The Council ended its 1952 Annual Meeting boasting representation of approximately 174,000 registered professional engineers. Another statistic which underscored the influence of the Council was the 35,000+ Engineers-in-Training in 33 states—a very impressive growth since the EIT program began in the early forties. Certainly this was an indication of the Council's fulfilling one of its Constitutional mandates: promoting "the public welfare by improving professional engineering standards…."

Syllabus Sound

In 1953, a breakthrough occurred in the development of a syllabus by the Council. In its landmark report, the Special Committee on a Syllabus of Examinations, appointed after the 1952 Annual Meeting and headed by Dean M. O. Withey of Wisconsin reported that "It is believed that what is contained in the [proposed] syllabus is sufficient for determining the technical qualifications for registration."

The committee reported that the syllabus was sound and usable and that it set forth in detail the basic sciences and engineering principles that the written exams should cover. The committee therefore recommended that the Council approve the syllabus as an adequate presentation of the principles underlying examination procedures and of the areas that should be examined by the various Boards. The committee further recommended that the syllabus be supplemented by specifications for examination questions "…which should be placed in the hands of every person who is called upon to prepare such questions." (The latter procedure was not common practice by the Boards.)

The purpose of the syllabus was to bring the practice of the various State Boards into close enough agreement so that the Boards would be willing to accept each other's decisions regarding the qualifications of applicants. (The committee went on to point out that it was not essential that the examination procedures of the various Boards be identical.)

The examination was to be a sampling process, since it was obviously impractical to examine candidates in every detail. The objective of the exams was to determine (1) whether or not the candidate had an adequate understanding of the basic sciences and engineering principles and (2) whether or not his training and experience had taught him how to apply basic sciences and principles to the solution of engineering problems.

The immediate purpose of the syllabus was to ensure proper distribution of the exam questions over the entire range of subject matter, over the two-day exam period of basic materials on the first day and applications on the second. A core of material common to all engineering curricula was to be included on the first day: mathematics, economics, physics, chemistry, electrical engineering, mechanics, and thermodynamics. The second day's questions were to be professional in nature for persons who had had several years of practical experience.

Thus, with the recommendation of the approval of the syllabus, the Council took a major step toward facilitating interstate registration.

Another first for the year 1953 was the fact that each of the four zones held interim meetings. The Council's Board of Directors recommended that the next year's budget allow a sum for miscellaneous expenses incurred as a result of such meetings. President Stanford pointed out two advantages of these interim meetings: (1) they allowed many State Board members to attend who could not attend the Annual Meetings of the Council and (2) they provided an opportunity for detailed discussion of matters which had not been settled conclusively at the previous Annual Meeting.

The Directors made another important recommendation at the 1953 Annual Meeting which promised to simplify the reporting procedure of the various committees. In the past the Council, on occasion, had operated rather loosely with regard to official action taken by the Council following submissions of committee reports, "with little consistency," according to Stanford: "…in the wording of resolutions and of the implications generally recognized in parliamentary procedure. Not infrequently in the past we have had resolutions to adopt, approve, accept, receive, or perhaps reject reports without regard to whether or not the report contains definite recommendations which require positive action by the Membership." The procedure which replaced this was taken from the Sturgis Standard Code of Parliamentary Procedure. The resolutions thenceforth were to be worded so as to allow the Council to "receive" a report. In receiving a report, the Membership was not committed to any findings or recommendations. The adoption of the Sturgis procedure promised to save much debate by eliminating such terms as "approving," "accepting," etc., following committee reports heard by the Membership.

The Board also adopted other procedures from Sturgis. Committees were required to present their reports to members in advance, and they were to be printed and distributed at the convention. A report could not be amended, and specific rules were outlined for disposing of committee reports.

A "cornerstone in…a growing sense of unity in the profession" was reported by W. H. Larkin, chairman of the Committee on Registration by Endorsement. This was the Council's general policy not to re-examine a candidate for a license. Forty-six states at this time gave "maximum possible credit" to exams given by other Boards. According to the committee, widespread use of an eminence clause,

recognition of out-of-state exams, the small number of reciprocity agreements, and general acceptance by 40 Boards of the National Bureau of Engineering Registration's Certificate of Qualification, all pointed to the Council's ultimate goals of efficient administration of registration laws, facilitation of interstate registration, and defining and maintaining national qualifications for registration.

The Engineer's Council for Professional Development, which reported pronounced increase in financial support from the State Boards, was concerned with several ongoing problems, the most important of which was accreditation. Criticism had been leveled at alleged low minimum standards of accreditation and accreditation of "fringe" curricula such as geophysical engineering, geological engineering, materials engineering, etc. The ASEE at its 1953 meeting had recommended that minimum standards for accrediting engineering curricula be raised. The Council now passed a resolution which strongly recommended to ECPD that no borderline or fringe curricula be accredited or be retained on the accreditation list if already accredited "unless they contain basic science and basic engineering subject matter at least comparable to the standard approved engineering curricula…."

At this time in the Council's history there arose again the controversy of the practice of engineering by corporations. The Committee on Uniform Laws and Procedures reviewed the subject but took no definite stand. There were many state laws which allowed a corporation to practice provided the work was under the direct charge and responsibility of a registered engineer. Those in favor of such a procedure felt that if said individual was unethical or incompetent, his license could be revoked. All registration was on a personal basis. No state or territory registered a corporation as such to practice engineering. President Stanford himself felt confident that it was possible to frame registration laws in such a way as to permit the practice of professional engineering by corporations without unduly jeopardizing the safety and life of the public. This issue would arise again, and Stanford urged a realistic approach and a careful consideration by "those of our Member Boards faced with any problem relative to changes in the registration law with respect to practice of engineering by corporations."

Reformation of the Council

The year 1954 was a time of reorganization for the Council. O. B. Curtis of Mississippi, in response to a request from President Russell G. Warner in 1952 to all Member Boards soliciting specific ideas on how to improve the procedures of the Council, submitted six specific recommendations which were adopted after some amendments.

These recommendations were the following:

1. That the following committees be divided into two groups, Group A and Group B: Constitution and Bylaws, Registration by Endorsement, Written Examinations, Oral Examinations, Qualifying Experience, Engineers-in-Training, Uniform Laws and Procedures, Effects of Registration, and Land Surveying. In order to save time, Groups A and B were to alternate every other year in presenting their reports and recommendations to the Council. Curtis, who had calculated that the aggregate cost of business sessions to all Member Boards was $1,000 per hour pointed out that the committees dealt with topics that had been "developed, presented and discussed to the extent that it is reasonable to expect that future reports will not be revolutionary in their nature…." Little, if anything, could be added to an exhaustive report in the span of a year. Hence, reports every other year could suffice, with delegates having access to the formative discussions of the committees during annual meetings the preceding year, if they were interested.

2. That the Council copyright its proceedings.

3. That the Nominating Committee be instructed to present two candidates for each elective office to be filled, except that of the President, so as to allow a genuine secret ballot.

4. That any proposal to utilize or expend the reserve funds of the Council in an amount over $3,000 be presented in tentative form to the Member Boards not less than 30 days before the Annual Meeting.

5. That the Council award a Certificate of Service after each five years of service to allow the Council to become less reserved in its recognition of members, thereby promoting greater visibility for the profession.

6. That the Council issue its commission of office over the seal and signature of the President and Executive Secretary to each elective officer.

These recommendations were referred to a special committee which was to study the functions of all standing committees and report at the 1955 Annual Meeting. This group was to report on which committees should be discontinued, which should be combined for more effectiveness, and what functions of the committees could be improved. As President S. G. Palmer pointed out, it was natural that new committees would be needed and others would have outgrown their usefulness because the Council was an evolving entity. Because the Council was now 34 years old, such a reformation seemed timely.

Another observation by President Palmer in his 1954 annual report reflected the growth of the Council: "One of the activities of the Council which is gaining in favor and importance is the interim zone meeting." He considered these meetings one of the most important activities of the Council. They allowed many Board Members to attend who were unable to attend Annual Meetings, and they provided for informal discussion in small groups. Moreover, the Northeast Zone reported a "first": it had discussed the feasibility of uniform EIT exams.

"Qualifying Experience" Redefined

One important step taken by the Council during this period concerned the definition of qualifying experience. "Experience" was one of the criteria for registration, and in the past, Council committees had tried to *list* experiences which could be considered to qualify an applicant. The Committee on Qualifying Experience now declared this approach to be "unsatisfactory," and recommended that a definition of the term be adopted instead of listing all specific acceptable experience. This move was critical at a time of proliferating specialties in professional engineering (electronics came into its own in the fifties, for example).

The definition, presented in part below, left each State Board free to use its own judgment in evaluating any given experience:

> 'qualifying experience'…means a record of a legal minimum number of years of *creative engineering work* requiring the application of the engineering sciences to the investigation, planning, design, and construction of engineering works.…It is a combination of [technical skills] plus the exercise of sound judgment, taking into account economic and social factors, in arriving at decisions and giving advice to his client or employer, the soundness of which has been demonstrated in actual practice.

The committee also recommended that reference blanks be changed to state the magnitude and complexity of the largest project on which the applicant worked during each engagement.

Also in 1954, recommendations were made concerning oral examinations, which illustrated the evolutionary nature of the Council and its priorities. The Committee on Oral Examinations stated:

> Due to lack of interest in and lack of reliability of oral examinations used alone, in determining an individual's fitness to practice professional engineering, it is recommended that, insofar as the Council is concerned, the study of oral examinations as pursued in the past be terminated, and that the Committee on Oral Examinations be abolished.

The committee pointed out that most, if not all, states which had recently revised their registration laws had abolished the oral exam, and in states where the oral exam was used, the Boards were reluctant to or would not recognize the oral exams of other states. There was apparently widespread distrust of these exams; as the committee pointed out, "The trustworthiness of the oral examination is dependent upon the efficiency of the examiner."

In the meantime, Colonel William M. Spann of the Written Examinations Committee submitted an extensive report on specifications for questions ("one of the most difficult and controversial subjects we have ever encountered") as well as other aspects of testing. Spann's committee had done considerable research on the examination procedure and now recommended that the report of the Committee on Engineers-in-Training be accepted as a standard guide for the first day of the procedure by the Committee on Written Examinations, as Part I and II, and that the two reports be combined for general consideration as reference material on Written Examinations practice. This would mean that the same exam could be given to both the engineering applicant and the EIT applicant.

(Parenthetically, it is interesting to note that Colonel Spann was opposed to written exams as a final measure for qualifying an engineer. "I don't think you can get a bunch of questions that can qualify a man," he stated in a discussion of his committee report.)

State Board Secretaries Report for First Time

These reports were back-to-back with another evolutionary development: the first report of the Committee on State Board Secretaries. A long-range plan for the Board Secretaries had been adopted in 1952; it was agreed that this plan would be followed generally, with each annual conference of secretaries considering a particular activity which the State Board Secretaries had to address, including such matters as examinations and law enforcement procedures and licenses.

C. S. Crouse, chairman of the Committee on ECPD, reported that a "definite raising of standards" had resulted from a report of the Evaluation Committee of ECPD which stressed increased emphasis in engineering curricula on fundamental science and basic engineering science, with further emphasis upon synthesis and design during the last year or two of the curriculum. Despite this increased emphasis on science, the report also stated the philosophy that "education directed toward the creative and practical phases of economic design, involving analysis, synthesis, development and engineering research is the most distinctive feature of engineering education," or expressed another way, is the "capstone of engineering education."

At the 1954 Annual Meeting, the Committee on Uniform Laws and Procedures reported on its *Synopsis of State Engineering Laws and Policies and Procedures of State Boards*. This was a critical step toward uniformity, for as Chairman R. J. Rhinehart pointed out, "If a State Board is lax in enforcing its state law, registrants often wonder why they have gone through the process of becoming registered. Each engineer believes, when he receives his certificate, that he is joining the engineering profession and that his State Board will protect his rights against those who are not registered." Indeed, one of the primary functions of the Council was to promote competence, and the *Synopsis* gave the Boards recognized standards for enforcing registrations. Each Member Board was given a copy of the *Synopsis* in a loose-leaf binder which allowed immediate updating of laws, policies, and procedures.

Council's Structure Changes

The next year, 1955, special committees made several recommendations which affected the structure of the Council.

The most important ones proposed by the Special Committee on Annual Meetings were: (1) that the number of reports presented each year be reduced, (2) that the program for the Annual Meetings be concerned with and confined to the purpose as outlined in the Constitution of the Council, (3) that the Annual Meeting be self-supporting, and (4) that financial assistance of local and state engineering societies be limited to entertainment functions.

The Special Committee on Committees and Mississippi Recommendations proposed, among other things: (1) that the Committee on Society Coordination be eliminated and that its functions be assigned to the ECPD Committee; (2) that a new Committee on Qualifications for Registration be created, while dissolving the committees on Written Examinations, Oral Examinations, and Qualifying Experience, and assigning their responsibilities to the new committee; (3) that the Committee on Registration by Endorsement be combined with the Committee on Uniform Laws and Procedures; and (4) that a new Committee on Public Relations be formed and that it absorb the functions of the Committee on Effects of Registration. The special committee also recommended that a President-Elect be elected rather than a Vice-President and that a procedure be set up to deal with the situation if for any reason the President-Elect could not serve as President.

Uniform Exam Administered by Northeast Zone

In 1955, a milestone for uniform exams was reached when 277 engineering seniors were examined in eight states in the Northeast Zone at one time using the same examination. The EIT Committee stated, "We believe this is the first step taken by any Zone to employ uniform questions on the same date for their State Board examinations." They further recommended that this program of cooperatively developing and administering a common examination be continued in the Northeast Zone and that similar programs be organized in other zones or between groups of State Boards within a geographical area.

The Committee on Qualifying Experience, extending the trend set the year before, continued to develop a generalized standard of qualifying experience rather than listing specific kinds of activities. The basic objective of requirements was to assure that the applicant had acquired, through actual practice of suitable caliber in engineering, the professional judgment, capacity, and competence in the application of the engineering sciences requisite to registration. The committee listed as requirements: (1) length of time—usually prescribed by law; (2) kind—experience normally acquired within the period prescribed by law; (3) quality—of a kind which would demonstrate that

the applicant had developed technical skill and initiative in the application of science, judgment, and responsibility; (4) scope—experience of sufficient breadth to attain competence in a basic field; (5) progression—a record indicating growth from simple work to that of greater complexity and responsibility; (6) capacity—a record indicating clear thinking and keen analysis essential to professional competence; and (7) viewpoint—a record showing that the applicant recognized the economic, social, and humanistic aspects of professional engineering.

Chairman Rhinehart of the Committee on Uniform Laws and Procedures reported that the *Synopsis of State Engineering Registration Laws and Policies and Procedures of State Boards* has been "well received, that it met an urgent need, and has been extensively used." It was now recommended (1) that future committees canvass all Member Boards annually to determine any changes made in their laws, policies, and procedures and that new sheets showing those changes be sent to each holder of a *Synopsis*; (2) that Section F on Examinations which accompanied the present report be approved and printed as part of the Suggested Standards; (3) that a study be made which might eventually result in all Member Boards recognizing a certificate from the National Bureau of Engineering Registration as evidence of qualification of registration by endorsement; and (4) that the Council endorse in principle some provision that would require the registration of federally employed engineers on the same basis as other engineers. Recommendation (2) included the suggested standard that any candidate failing to score 50 percent or better on either the eight-hour exam on math, engineering, and physical sciences *or* the eight-hour exam on professional practice should not be passed.

The Rhinehart committee also reported on an important ruling by a U.S. District Court concerning the registration of corporations. The D.C. Board had refused a license to a corporation which in turn sued the registration Board. The court ruled that "only a natural person can come within the definition of professional engineer…It is clear to the court that the statute must be construed by its very terms as inapplicable to corporations and applicable to natural persons only." The committee also reported on other favorable decisions which put the weight of the courts behind the Member Boards.

At this time in the Council's history, the growth and fragmentation of the engineering profession was reflected in a proposed survey by the Engineers' Council for Professional Development. The proposed survey would study present and prospective needs for engineering services; improvement in the utilization of engineers and supporting technical personnel; the scope and nature of the education and training required; the problems of registration, unionization and ethics involved; and "all other matters pertinent to determine the most effective organization of the profession to meet its public responsibilities and professional opportunities…." The executive committee of the ECPD was charged with preparing a prospectus of the survey and forwarding it to the ECPD's eight constituent societies, and the EJC soon joined the ECPD in this task. It appears that various factors hindered the completion of the survey.

Enforcement Problems Outlined

The year 1956 was one of legal issues: court rulings, enforcement, definitions, etc., and the status of unions.

At the State Board Secretaries Conference in Los Angeles, three papers were presented which highlighted important points on law enforcement procedures—always a pertinent subject. A summary of these reports gives insight into the problems faced at this point in history by Boards of all sizes—small, medium, and large.

Frank W. MacDonald, Executive Secretary of the Louisiana Board, reported that in the first five years of operation of the Board (1950–55, Louisiana adopted the Model Law in 1950) 415 cases had been investigated, with 321 cases settled, 56 pending, 5 favorable court decisions, and *no* unfavorable court decisions. MacDonald said that the major portion of the investigations dealt with listings in phone directories and city directories, which had been checked page by page. (The Board also subscribed to a daily commercial newspaper which listed engineering projects planned for construction in the state.) Upon indication of a possible violation the executive secretary wrote a letter of inquiry to the firm or individual involved. The Board found that in most cases of advertisements, the violations had occurred because of lack of knowledge of the registration law or "over-enthusiasm on the part of the Telephone Company to sell business listings…." More difficult cases were referred to the Board's attorney or the district attorney.

In cases of violations of practice, the initial investigation was usually made through the offices of the Board. MacDonald pointed out that one serious problem confronting his Board was that of professional engineers registered in other states performing services in Louisiana without being registered there. The Board's attorney had advised that delays involved in invoking the provisions of the registration statute generally made it impractical to take action against such persons.

Edward T. Erickson, one of five special investigators for the California Board, said that his Board was concerned with two laws: the Civil and Professional Engineers Act and the Land Surveyors Act. The first covered the registration of professional engineers in the branches of chemical, civil, electrical, mechanical, and petroleum; and the issuance of authority to use the title "structural engineer" to those registered civil engineers who qualified. Of these categories, the only one in which the *practice*, as well as the use of the title was regulated, was civil engineering. Here Erickson touched upon one of the prime reasons for the need for a Council…differences in state laws…when he stated, "The primary factor, perhaps, in the California Legislature regulating the practice of civil engineering is the earthquake hazard that exists in this state, and the consequent mandatory need for competence in the design of buildings and other structures comprising fixed works." Erickson pointed out that the law's definition of civil engineering was important because it was used in enforcement. The California law was very strong in that not only did it limit the practice of civil engineering to registered persons, it also prohibited unregistered persons from "…managing or conducting as manager, proprietor or agent, any place of business from which civil engineering work is performed, solicited or practiced…."

Violation of the Civil and Professional Engineers Act was a misdemeanor. Erickson said that the most common enforcement problem used to be the illegal practice of civil engineering by so-called designers or draftsmen, building contractors, and individual builders/owners, who designed and drew plans for buildings coming within the definition of civil engineering. The California investigator said, "…Violations of this kind ranged from the very extensive plans and specifications prepared by a designer or draftsman for a large commercial or public building to the very meager plans, if any, drawn on wrapping paper by an individual owner/builder for his own building." Such violations had diminished principally because of the public relations and educational enforcement carried on by the Board's investigators. These efforts consisted of bringing the requirements of the registration act to the attention of local and county building inspection officials and in warning first-time violators concerning the law's requirements.

Erickson said that one of the most numerous enforcement problems was that of plans done in whole or in part by a nonqualified person, usually a designer or draftsman, but bearing the seal and/or

signature of a registered professional engineer. The investigator said that the number of civil engineers engaging in this activity was "not inconsiderable," from the standpoint of the investigators, though relatively small considering the profession as a whole. He went on to point out that, "They are in practically all cases, full time employees of engineering firms, industry, or by various local, county, state or federal governmental agencies, and carry on their work for unqualified persons in their spare time…." As a group, they were not "professional minded," said Erickson, and seemed interested chiefly in using their registration for easily acquired extra money. Fees they charged draftsmen, designers, or contractors were small; a civil engineer or architect in legitimate practice had to charge a larger fee to a client than the "cutrate draftsman/civil engineer combinations."

These violations created difficulty in enforcing the registration law because, according to Erickson, "a judge or jury is very reluctant to convict a nonqualified person for soliciting and practicing civil engineering when a registered civil engineer's seal or signature appears on the plans."

Another type of enforcement problem which California faced, along with other states, involved the formation of firms or corporations organized to practice civil engineering. Such entities were organized by the entrepreneurs connected with military or industrial construction projects in the state. In some cases such firms, even though employing registered engineers, were not complying with the Civil and Professional Engineers Act, and such situations, plus the permissibility of using fictitious firm names, added considerably to the enforcement problem.

E. A. Buckhorn, executive secretary of the Oregon Board, said that the biggest enforcement problem in his state was the fact that the public, particularly the segment which retained or employed engineers, was ignorant of the registration law. Such ignorance made it possible for nonregistered persons to obtain employment readily, even if they were unqualified. Hence, the Oregon Board had inserted in the telephone directories of major cities, adjacent to the engineering headings, an advertisement stating that it was unlawful for a nonregistered individual to practice or to advertise to practice engineering.

Buckhorn reported that since the insertion of the advertisement in 1946, the number of listings by nonregistered persons and firms had "dropped almost to zero." He further stated that most violations could be stopped by "the friendly approach," i.e., education concerning the registration law and its purpose of protecting the public.

In more difficult cases, however, Buckhorn pointed out that "prosecution of violators entails a multiplicity of problems" and was a time-consuming and expensive matter. The district attorney was reluctant to prosecute because of his unfamiliarity with the registration law and precedents in his own and other states. Accordingly, the Oregon executive secretary recommended that copies of all decisions pertaining to any registration law or to enforcement of any such law be filed with the Council, together with a brief description of the case and the citation of where the decision is published. The brief description would appear in the *Registration Bulletin*, and any Board desiring the full text could obtain a copy from the Council. This recommendation was approved by the Secretaries Conference.

Unions Discussed

Another critical problem besides enforcement which the engineering profession faced at the time was that of unionism—more specifically, the growth of unions among the fringe groups which worked in connection with professional engineers. (It should be pointed out that many Council members felt that whether or not a man joined a union was "none of our business.") In fact, the

biggest labor organization in existence (the AFL-CIO) had announced its intention of attracting not only unlicensed engineers but *all* engineers in the country.

The following conditions were brought out in a talk by Murray Wilson of Kansas, and in the discussion which followed.

At this time in the Council's history, there were 207,000 registered professional engineers. During the last six years, men were being registered at the rate of 9,000 per year. Wilson said that there were 600,000 engineers in the country [the definition of engineer was later challenged], and at that rate, it would take 48 years to register those who had not been registered. Wilson felt that, "Every engineer who is not licensed is an invitation to some labor union to get him into their fold." A membership of 30,000, mainly in the manufacturing industry, was claimed by ESA, the largest engineers' union in the country. (Wilson pointed out that he applied a "factor of veracity" and brought that figure down to 11,000.) However, it was felt that the number of *registered* engineers belonging to unions was "relatively very small." The Taft-Hartley Act, contrary to the earlier Wagner Act, provided that a professional engineer could not be forced into a union against his will, by majority vote of all employees in an engineering department. Indeed, the primary purpose of the EIT was to give the young engineer paraprofessional status so that he would not be subjected to union pressure.

Finally, at the 1956 meeting, comments on the field of electronics showed the flexibility and evolutionary nature of the Council. With the development of computer technology, electronics began assuming significant importance. Dr. Turman of Stanford University had written on the fact that electrical engineers in the schools were shying away from the traditional courses and going into electronics. It was felt that employers seemed to prefer mathematicians and physicists to the engineers. Turman said in an article in the proceedings of the Institute of Radio Engineers that, "Engineering educators will have to accept electronics and similar areas of importance that lie between pure science and traditional engineering as being engineering, because otherwise colleges of applied science will develop on the campus and insulate engineering from pure science while taking over the interesting and creative areas." Turman's insights were prophetic, for one day the Institute of Electrical and Electronics Engineers would be numbered among the national professional societies, legitimizing what at this period was an esoteric field.

Council Approves Corporate Practice

In 1957, the Council grappled in earnest with an issue which had haunted it for several years: the corporate practice of engineering. On the face of it, the issue was clear cut. Many corporations were engaged in engineering activities; however, it is not possible to "register" a corporation in the sense that individual engineers are registered. Corporations cannot stand an examination mandated by state registration laws, for instance. The corporate practice of engineering had both proponents and opponents and of course entailed significant ramifications for the Model Law and for the profession's canons of ethics.

This issue had been studied at length by engineering groups. Indeed, Chief Justice John Marshall had defined a corporation as "an artificial thing, invisible, intangible, and existing only in the contemplation of law."

At the 1957 Annual Meeting, William H. Larkin of New York discussed corporate practice in his state, relating it to the overall issue. Said Larkin, the basic question was, "May licensed natural persons, acting in concert, practice professional engineering through the corporate form of organization?"

Larkin said that a controversy had resulted when in 1952 a New York law was amended to require "all corporations lawfully practicing engineering or land surveying" to register biennially with the state education department. Newell Freeman subsequently wrote that the amendment was "designed to identify corporations lawfully practicing engineering and/or land surveying and to make it possible for them to continue without hindrance or investigation." The use of the word "register" was of course a red flag, since corporations are not natural persons and could not be registered, even though responsible (and registered) engineers who allied themselves with a corporation practiced as *individuals* through the corporate form of organization.

In any event, two camps arose which represented the two sides of the issue—both of which had reasonable opinions. The stances below, quoted from Larkin's report in the 1957 *Proceedings*, suggested legitimate concerns on both sides:

Proponents

1. Engineers, practicing within the corporate form of organization, do so as individuals, but have back of them the financial and technical resources of their organization, thus assuring the public of the competent economical completion of a project.
2. Public and private projects are of such magnitude today that individual professional engineers need the backing of the multiple talents and services made available by the corporate form of organization.
3. Engineers practicing within the corporate form of organization are able to conduct research, develop new processes, and guarantee results, because of the ability of the corporation to attract new capital as well as to retain for itself a significant portion of its earnings for these purposes.

Opponents

1. Professional ability and integrity are personal attributes, not transferable from one engineer to another, or to a corporation.
2. The public interest is best protected if full engineering responsibility rests with those who personally have accepted the tenets of professional engineering in obtaining individual licenses to practice.
3. No corporation, except one fully owned and fully managed by professional engineers, would assure engineering control of public practice.
4. A change in the Education Law to permit and regulate public practice by corporations fully owned and managed by professional engineers is impractical because it is unlikely to receive sufficient support and it could not be enacted into workable legislation.
5. Extension of public practice to corporations beyond that now permitted would weaken the position of engineering as a profession and inevitably would lead to further relaxation of the requirements for corporate practice, which would not be in the public interest.

Many organizations, including NSPE and EJC-ECPD, favored liberalizing laws to allow the corporate practice of engineering. In fact, at this time 34 states permitted practice through the corporate form of organization, 15 registration laws contained no provisions regarding it, and two states forbade the registration of a corporation as a professional engineer. Larkin himself summed up

what appeared to be the only logical course for the Council to take when he concluded, "If the official position of this Council is to reflect the philosophy of the vast majority of the Professional Laws under which its several boards operate, it must adopt as its own a position endorsing the practice of engineering through the corporate form of organization."

As a matter of fact, a subcommittee on Corporate Practice had been studying the issue. This group, headed by Edward H. Barry, was commissioned to suggest a law that would be "satisfactory" and recommend it to the Council.

Because the majority of states had legalized corporate practice, and because the large engineering societies had adopted policies favoring legalization of corporate practice, the subcommittee recommended the following for adoption by the Council:

> 1. The Council is in favor of permitting the practice of engineering through the medium of a firm, association, partnership, company, corporation, or other form of organization, *provided those officers and other persons responsible for such engineering practice are legally qualified as registered and licensed Professional Engineers*.
> 2. The Council urges each registration board to exert its best efforts to amend its registration law, where necessary, to give effect to the policy in paragraph 1.
> 3. It is the policy of the Council that corporate practice shall not be construed as requiring the registration of an engineering firm, association, partnership or corporation as a Professional Engineer, but it does not object to the issuance of a certificate of qualification to such an organization as evidence that it has complied with the requirements of its personnel as to registration.

This report was received by the Council and published in the *Proceedings*. It appeared that corporate practice was now legitimized. And perhaps just in time.

This same year, Russia launched Sputniks I and II. The United States needed all of the advantages which proponents of corporate practice championed: vast financial and technical resources, multiple talents, research and development, and guaranteed results!

Simultaneously with the problem of corporate practice, the Council continued to wrestle with the ongoing issues of uniform exams, professional ethics, eminence, etc. However, new challenges lay ahead as well. The Committee on State Board Secretaries had assembled "Zone Kits" containing copies of all forms used by the Boards, and these were circulated among the Boards. For the first time in history, the Canal Zone sent a representative to the Annual Meeting. The long-awaited *Digest of Court Decisions Concerning the Registration of Engineers and Land Surveyors* was printed and distributed to all Boards. Edward R. Stapley had become the first president who had been first selected as President-Elect. The Committee on Public Relations was flexing its muscles with a more dynamic approach to its assignment.

There was another development which the Council's Old Guard might have called the most significant milestone of the time: the Board recommended a retirement date for T. Keith Legaré, the Executive Secretary who had long before become one of the pillars of the Council, a *ne plus ultra* among dedicated members.

First International Conference in the United States

Understandably, the engineering profession eventually had to promote international cooperation on a more comprehensive scale than it had in the past. The principles of engineering

do not change across national boundaries, and it was to be expected that engineering organizations would try to extend their influence concerning qualifications for registration, professional ethics, etc. Hence, the first International Conference on Engineering Registration Organizations in this country occurred in 1958 in New York. (The first such conference to be held anywhere occurred in Toronto the year before.)

Space exploration, the field of atomic energy, and electronics appeared to dominate the scientific community. In all the sciences, worldwide cooperation had long been a tradition, and during the fifties this effort was reflected in such movements as the International Atomic Energy Agency and the International Geophysical Year. The engineering profession's leaders were now called upon by the course of events to promote similar global cooperation. At the 1958 Conference, educational standards and accreditation of curricula were principal topics. A resolution was adopted suggesting that a permanent joint organization of the Council and the Canadian Council of Professional Engineers be established to facilitate exchange of information, study mutual problems, and generally improve cooperation between the registration bodies of the United States and Canada.

Public Relations Awareness Grows

A particularly interesting development at this time was the work of the Committee on Public Relations. It is probably safe to say that from its beginning, the Council had maintained a rather low profile, considering the influence it enjoyed in shaping a vital aspect of American life (that is, the standards governing the practice of engineering). Now, however, the committee on Public Relations prepared a guide for the members of the National Council of State Boards of Engineering Examiners with one of its expressed purposes being to foster a "greater acceptance by the public of engineering registration and the engineering profession." Its recommendations were specific, thorough, and far-reaching, and showed a high level of sophistication concerning public relations. Suggestions included everything from the display of P.E. emblems on automobiles to the promotion of registration as a prerequisite for employment in such positions as city engineer and county engineer.

While some members took issue with the fact that a number of the suggested activities duplicated the work of NSPE, and that some suggestions appeared to be far afield from the Council's Constitutional mandates, the report of the Committee on Public Relations was received nevertheless. In any event, the significance of the report was that the Council was becoming very much sensitized to the role which public relations could play in promoting the goals of the engineering profession.

Land Surveying Gains Visibility

Another development at this time revealed the increasing complexity of the Council's role. The Committee on Land Surveying recommended that the Zone committees on land surveying emphasize two issues of concern to the Council Committee: the definition of land surveying and the question of separate boards versus joint boards of engineering and land surveying. The committee explained that, "Recent years have seen tremendous, and in some cases almost explosive, expansions in metropolitan and suburban areas across the country." This increased land use resulted in greater demand for the services of the land surveyor and at the same time increasing land values were making the surveyor's work much more exacting. Moreover, the discoveries of new sources of minerals contributed to the trends. The result, according to the

committee, was new interest in "…the questions of why, how, and where, with regard to the regulation of people performing this work." Many organizations were studying definitions, qualifications, classifications, etc. with the goal of creating legislation or revising existing laws. The committee was also to study the feasibility of classifications such as land or cadastral, mining, design and construction, geodetic, cartographic, aerial, photogrammetric, hydrographic, etc., with the goal of assigning these classifications to land surveying or engineering "to clarify the area of overlap."

First Woman Discussant

Finally in 1958, when the Council had been in existence for 38 years, for the first time a woman appeared as a discussant at an Annual Meeting: Mrs. Clemmie Wall of the Missouri Board participated in the presentation of the State Board Secretaries Conference.

Ironically, this historic step was promoted not by a Young Turk from a liberal eastern state, as one might expect, but O. B. Curtis of Mississippi, who had been a Council member since 1940. Said Curtis in reminiscing about the event, "…as chairman of this committee, I got a little criticism for putting a woman on the program like this. This was the first time that it happened. She was very confident and very capable and I had *no* reservations about it."

Model Law Revised After 13 Years

The magnum opus of the National Council of Engineering Examiners has been its Model Law, which undergirds its constitutional mandate of promoting the public welfare through the efficient administration of engineering registration laws, the facilitating of interstate registration, and the defining and maintaining of national qualifications for registration. By 1959 the Council was the unchallenged custodian of the Model Law for the practice of engineering in this country.

Now, as the third era of the Council drew to a close at the 39th Annual Meeting, the Committee on Model Law Revision presented recommendations for updating that Model Law.

A Model Law was first suggested to the Council by Secretary T. Keith Legaré in 1926 (the ASCE had drafted such a law in 1911, and six national societies revised this draft in 1915). In 1929, Legaré's suggestion was adopted that "a recommended uniform registration law for professional engineers be compiled by the Committee of the American Society of Civil Engineers with the collaboration of Committees of the National Council of State Boards of Engineering Examiners, American Society of Mechanical Engineers, American Institute of Electrical Engineers, American Railway Engineering Association, American Association of Engineers, and the American Engineering Council." (This intersociety/association cooperation has prevailed throughout the history of the Model Law.) That Model Law was approved on April 15, 1932, and was recommended to states, societies, and committees as a model to be used in the framing of all new registration laws and the amending of existing laws. A revised draft was adopted in 1937 after having been submitted to State Boards, engineering societies, and individuals for input. Therefore, as Legaré pointed out in a May 1940 issue of *Civil Engineering*, the Model Law "may be considered to represent the consensus of those experienced with, and most interested in, the registration of engineers." The next major revision followed World War II, in 1946, to reflect a wealth of court decisions, legal opinions, and expanding scientific knowledge and technology.

The 1959 revision which was now presented to the Council had to reflect similar developments. And as in the past, this revision was based on input from all those involved in shaping the practice

of engineering and reflected the work of several years. A questionnaire had been sent to all Board Members requesting opinions on controversial issues and comments on points to be considered. Comments and suggestions were also invited from all national professional groups, and 19 took part in the February 1959 conference on revision. The replies to the questionnaires, which formed a cross section of opinions, were carefully analyzed and considered by the Committee on Revision of the Model Law. Copies of the proposed (revised) Model Law, dated August 19, 1959, were furnished to the Council so that it could take action on its contents at the August 19–22, 1959, Annual Meeting in Roanoke, Virginia, and authorize the committee to complete the revision activities. Committee Chairman William M. Spann reported that the final draft, including all accepted revisions, would be submitted at the 1960 Annual Meeting.

Legaré summed up in his 1959 annual report, "the Model Law for the Registration of Professional Engineers and Land Surveyors and Providing for the Certification of Engineers-in-Training," has probably been given more attention and cooperation by more engineering groups than any other project undertaken by the engineering profession.

Legaré Steps Down

Keith Legaré would step down as Executive Secretary at the end of the current fiscal year. "Mr. National Council," as President William H. Larkin had dubbed him, had served on the Council for 37 years, 35 of them as Secretary. He had also served as president in 1930–31, and as Executive Secretary of the National Bureau of Engineering Registration, he had issued 2,254 Certificates of Qualification. In addition, Legaré had served as past editor of the *Registration Bulletin* for 79 issues and had been a member of the South Carolina Board of Engineering Examiners (35 years as its Secretary) and a number of professional societies. All those contributions to his profession were made while he was engaged in such positions as city engineer in his hometown of Columbia, South Carolina, and as assistant construction engineer for the South Carolina Highway Department, not to mention associate engineer with the Corps of Engineers, War Department, during World War II.

The Information Age Arrives

At this point in its history, the Council or its Registration Bureau was mentioned in three-fourths of the state registration acts and two Acts of Congress. It was generally recognized as the national agency of all engineering registration boards and as a bureau of information regarding registration. Its 53 Member Boards showed remarkable cohesiveness concerning its overall goals and activities, if not concerning specifics.

Now, with the presentation of the Model Law Revision and the retirement of Keith Legaré, the third period of the Council's history was drawing to a close. The next period would see new challenges, for in 1956, though unheralded, the Information Age had arrived: for the first time in the history of this country, white-collar workers in technical, managerial, and clerical jobs outnumbered blue-collar workers. More important, in the last half of the fifties, two inventions, the microchip and the integrated circuit, would change forever the face of American industry—and the engineering profession as well.

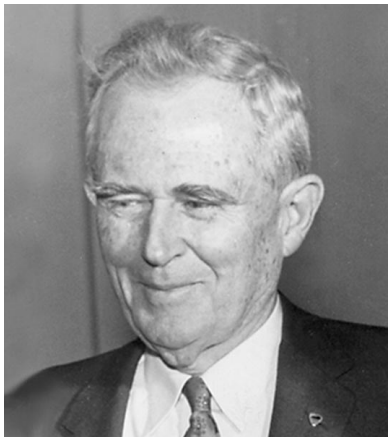
John C. Remington, Jr.
New Jersey
1946–1947

George M. Shepard
Minnesota
1947–1948

Alexander Blair
Florida
1948–1949

Clarence L. Eckel
Colorado
1949–1950

Russell G. Warner
Connecticut
1950–1951



C. S. Crouse
Kentucky
1951–1952

A. G. Stanford
Georgia
1952–1953

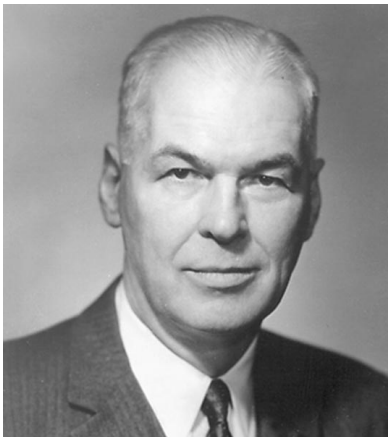
Stanley G. Palmer
Nevada
1953–1954

John W. Gore
Maryland
1954–1955

Bruce Williams
Missouri
1955–1956

Edward R. Stapley
Oklahoma
1956–1957

Allen S. Janssen
Idaho
1957–1958



William H. Larkin
New York
1958–1959

CHAPTER 4
The Council Fulfills Its Potential
1960–1983

The Council began its next era with a new Executive Secretary, new headquarters, and a new Model Law.

Sams Becomes Executive Secretary

On July 1, 1960, Dr. James Hagood Sams assumed the position of Executive Secretary. A graduate of Clemson University in Clemson, South Carolina, with a B.S. degree in electrical engineering, Sams also received a master's and a Ph.D. degree from the University of Michigan. He had served as dean at Clemson since 1951. Besides being active in Council, State Board, and society activities, he had attained the rank of colonel in the Army Air Corps during World War II. When Sams took office, the Council moved its headquarters to the new civil engineering building at Clemson, from Columbia, South Carolina, the city which had been its headquarters since 1923.

At the beginning of the preceding era—1946—the Council still lacked three Boards as Members. Now, in 1960, all states and territories had boards of registration. In 1940, there were approximately 92,000 registered engineers; there were 260,000 in 1960, an increase of 280 percent. The proposed budget had been $14,000 in 1946. The budget now anticipated an income of $31,500. The first Zone Meetings conducted during the Annual Meeting of the Council occurred in 1947, and the first Interim Meeting was held by the Central Zone in 1948 in Columbus, Ohio. By 1960 all four Zones had been holding Interim Meetings for several years, with discussions of common exams for Engineers-in-Training and Professional Engineers.

It now remained to be seen if the Information Age would have a profound effect upon the Council as did the post-World War II years.

Model Law Revised

It was significant that the last Model Law Revision had been completed and accepted in 1946, the beginning of the preceding era, just as the present era was getting under way with a major revision of the law.

The 1960 revision added provisions for injunction procedures; raised the qualifications for registration; eliminated the eminence clause and the grandfather clause; and added provisions for corporate and partnership obligations and for interstate railroad, telephone, telegraph, and other public utility company employees under the exemption clause. The law also spelled out requirements for registration as an Engineer-in-Training; and the definitions of "engineer," "practice of engineering," etc., were also addressed.

In an introduction to its report, the Committee on Model Law Revision pointed out that the Model Law was intended as a reference work, "to be used as a guide and as an aid in the preparation of revisions to existing registration laws, and to modify and improve existing regulations, *which should*

simplify and stimulate reciprocal agreements between State Boards." The committee went on to point out that the proposed law raised vital questions which needed to be answered in each state, "but the answers may not necessarily be final or the best in any particular state."

The document had been reviewed by several eminent lawyers from different parts of the United States, and a number of their suggestions had been incorporated. The Committee put forth the provisions as "sound and realistic ideas" to be used in the revision of registration laws, to provide greater uniformity of qualifications for registration, to raise these qualifications to a higher level of accomplishment, and to simplify the interstate registration of engineers. Registration by endorsement was made mandatory.

One very important—and noncontroversial—change was that the act authorized the State Board "to apply for relief by injunction in the established manner provided in cases of civil procedure, without bond, to enforce provisions of this Act, or to restrain any violation thereof."

Certainly the most controversial provision of the Model Law was Section 22(d): Corporate and Partnership Obligations. This section stipulated that all personnel offering/performing engineering services through corporations be registered and be individually liable for their professional acts and that engineering documents bear the seals and signatures of the engineers who prepared them. The primary purpose of the committee's draft, according to Robert Williamson Jr., vice-chairman of the Committee on Revision, was to require that all persons who act on behalf of a corporation in an engineering capacity be registered professional engineers.

In any case, the Model Law was adopted by a roll call vote of 37½ to 5½, and copies of the law were printed and distributed. The committee had studied the controversial elements exhaustively, and their recommendations were intended as a guide to legislatures—a controversial guide which would in turn be revised in later years to reflect the evolving nature of the engineering profession.

Ironically, the fervor caused by the Model Law revision belied the opening remarks of President Lawrence E. McCartt at the 1960 Annual Meeting. He pointed out that at this time in the Council's history, reciprocity (the main goal of the Model Law) was not the problem that it had been in the past. McCartt observed that, "The competent engineer may cross state lines to carry on the work of his profession without encountering too much difficulty in obtaining registration." So despite the controversy which surrounded certain aspects of the Model Law, overall it appeared to be serving the profession well. Moreover, the controversy was eliminated by the fact that the Revision Committee recommended the continuity of revision studies by the Committee on Uniform Laws and Procedures to keep current the report of the Revision Committee. Therefore, the Council could amend or revise the document at any time.

Revision Committee Made a Standing Committee

The Council of Engineering Examiners is a council of committees. Its success in its mission—to act as a forum to encourage efficient registration laws—has always depended on the effectiveness of its committees. Now, with a new Model Law which had stirred up controversy, the special Committee on Model Law Revision was made a standing committee by a constitutional amendment. The staffing of the committee "required a delicate balancing of interests" so that there was no thought of loading it, President A. T. Henny observed later. It was empowered with completing a comprehensive review of the law, with the purpose of possible revision, at least once every five years. The amendment was timely, for already the Southern Zone had proposed that the hotly debated section 22(d) be eliminated.

The Southern Zone proposed, besides the deletion, the addition of a provision to the effect that, in corporate practice, the majority of the shares of the corporation's voting stock were to be owned by individual registered professional engineers and that the majority of the directors and officers were to be registered professional engineers. This concept was not new; but as Keith Legaré had pointed out earlier, proponents of such a provision wrongly assume that there is a relationship between the policies and decisions of a corporation and the stock ownership. Legaré had maintained that, "These requirements could not be met by the corporations which are the largest employers of our engineers today."

The Southern Zone's philosophy did not prevail. Today's Model Law has no such provision. However, the Zone's action is a good illustration of the methodical give-and-take progress which the Council has promoted over the years. The Council's Constitutional mandate is that it shall serve as a forum for the exchange of ideas concerning registration.

Northeast Zone Pioneers Exam

The Northeast Zone reported a development which had a better chance of survival: the first common professional exam. The Zone had pioneered the common EIT exam and was optimistic concerning the professional exam. This should be considered a major development in the move toward uniform exams, a primary criterion in reciprocity.

International Thrust Continues

The concept of reciprocity continued to develop on an international scale. The Joint International Committee had met twice each year since 1959, the year of its founding. The first yearly meeting was in connection with the annual meeting of the Canadian Council of Professional Engineers, and the second preceded the Council's meeting. The committee was currently working on articles of agreement concerning the exchange of information on the recognition of Canadian and American engineering curricula, the attempt to facilitate reciprocity, the publicizing of information concerning registration and temporary permit requirements of the various provinces and states, and the exchange of information on the evaluation of foreign engineering curricula. Joint studies of foreign training systems were to be conducted with the aim of achieving as much uniformity as possible in accrediting such curricula.

Another note relating to the Council's expanding horizons was that Guam, on the other side of the world, was admitted to membership. (Membership had leveled off in 1957 at 53.) With Guam's entry into the Council, the membership reached its 1961 number of 54 political entities. (At this writing, membership is 56 because two states, Florida and Tennessee, are represented by both engineering and land surveying Boards, and Illinois is represented by engineering, land surveying, and structural engineering Boards.)

Work of the Finance Committee

The work of the Finance Committee was usually unsung at the Annual Meeting of the Council, for the affairs of the committee during the year were routinely referred directly to the Executive Secretary, President, and Board of Directors. In 1962, Col. John Beretta, chairman, led the committee in reinvesting the Council's reserve and retirement funds to meet the changes which were made in the Bylaws the preceding year. Upon the recommendation of Beretta, whose close contact with the banking industry made it possible for him to give excellent advice, part of the funds which were received early in the year were invested in certificates of deposit.

Growing Importance of Zone Meetings

By the early sixties, the Zone Meetings had become a major function of the Council. There was a trend to pattern these meetings after those of the Council: the work was done by committees which reported at the Zone Meeting. Originally the meetings were conceived to encourage discussion of zone problems in detail not possible at the national level. Gradually, however, all zones began devoting considerable time to national rather than regional business. While this was beneficial to the Council as a whole, it encroached on the time available for zone business. This problem was solved by lengthening the Zone Meetings.

National Uniform Exam Realized

In 1963, a monumental development occurred which fulfilled years of arduous work on the part of many Council Members. Arnold L. Henny, chairman of the Committee on National Exams, at the conclusion of his committee report moved that the Council authorize the continuance of his committee for another year, "with the specific assignment of producing a workable plan for the implementation of a national exam, such a plan to include recommendations for a committee format, methods of operations and costs…." The committee was to report at the 1964 Annual Meeting. As an example of personal dedication, it is worth noting here that Past President Henny (1961–62) was now, in 1963, chairing what was probably the most important working committee of the Council.

A national uniform exam for professional engineers was inevitable. Reciprocity had been a continuing goal since the Council's founding more than four decades earlier, and it was obvious that one way to facilitate reciprocity was to standardize the examination upon which registration was awarded.

The uniform EIT exam had been realized earlier, no doubt because simpler parameters applied. The first uniform EIT exam had been administered in the Northeast Zone in 1955. The history of a formal movement toward a uniform professional exam was more recent, with the Northeast Zone again leading the way with the first common professional exam administered in 1961. In 1962, the Central Zone completed "a study of the consistency of grading among Boards," and the Western Zone recommended the development of a national EIT exam and national branch examinations in the major branches, with sufficient quantity of materials to allow wide latitude for individual state selection of questions.

The Committee on National Examinations was appointed following the 1962 Annual Meeting in Kansas City, where it was proposed that the Council undertake the preparation of an examination similar to those used in the EIT examinations to be made available to all Boards wishing to participate in its use. The stated purposes were fourfold: (1) advancing a significant step toward uniform practice facilitating comity, (2) an upgrading of the examinations of some states which might be considered below standard, (3) simplification of operation for many Boards, and (4) reducing expense to most Boards.

With no reliable data on which to base a decision, the Council declined at that time to take action on a motion favoring a national exam and asked for the formation of a Committee on National Examinations which would study the issue and report the next year. That committee administered a questionnaire to obtain information. Of 54 Boards, 47 replied.

The key question asked was, "Do you favor the principle of a national examination?" Responses were: yes, 32; no, 6; and no answer, 9. Most of the nine abstaining votes were qualified by such statements as "maybe."

This response, together with a very favorable response to the question, "Would your Board utilize an examination prepared by the Council?" was the basis of the committee's recommendation that the Council approve the principle of the development of a national examination for both EIT and professional branches, prepared under its direction and made available to all State Boards. This recommendation was carried with no dissent.

The committee's action must have been particularly gratifying to President Weston S. Evans, who in his report had remarked that "…it is absurd for 54 Boards…to prepare 54 exams to accomplish the same purpose…." Evans felt, moreover, that if this particular step—a national exam—could be taken, then greater uniformity would come about in many other areas at a much earlier date than otherwise. "In many cases," he commented concerning lack of uniformity, "the trouble is not with the laws, but with the thinking of Board Members."

Evans pointed out that uniformity was still elusive in many areas. Some Boards did not recognize the NBER Certificate—a serious concern for engineers who needed to be registered in several states. Some states required written exams, and others did not. Some required references from registered engineers in the state where registration was sought. There were still variations in requirements relating to age, residency, citizenship, and other aspects of registration. Evans' concern was that a sentiment favoring national registration might grow into some form of certification at the national level.

Growing Complexity of Engineering

That concern was grounded in the growing complexity of the profession as well as of the social environment. Evans expressed this in terms of the Council's Constitutional mandate:

> Education is becoming much more scientific than formerly. As long as we adhere to the principle that four years is sufficient to educate a prospective engineer to the first academic degree, the young graduate will be deficient in applied science and engineering practice. Is this deficiency in the best interest of the public whose safety and well-being we are pledged to protect?

Evans explained that on professional examinations he had noted a few problems which many recent four-year graduates were able to solve but which would not have been studied until the graduate level only a few years before. Such problems could be avoided because the examinee had a fairly wide choice. However, as the president pointed out, the Council had to be concerned about whether knowledge in advanced areas of technology "should not be a qualification for registration in the not too distant future."

Evans was coming to grips with the Information Age and its accompanying phenomena, for scientific knowledge had begun to increase at a rate which was difficult to absorb. (At this writing, there are now more than half a million scientific journals published, for instance.)

Horizon Expanded Southward

Quite naturally, with the arrival of the Information Age, one aspect of which was the internationalization of knowledge, the recently formed Joint International Committee had to

expand its horizons. As Joseph D. Guillemette of the committee reported, not all the engineering done on the North American continent took place in Canada and the United States, but it also included countries southward. Therefore, the committee at this time was looking into Latin American procedures, with the aim of promoting understanding. Negotiations with Mexico were proceeding, led by President Jack Beretta. It was difficult for U.S. engineers to obtain registration in Mexico, and the committee report indicated that further negotiations were to be instituted to ease that situation. (On a more positive note, it was the committee's impression that not much interference was experienced by those U.S. engineers who did practice there.)

In addition, the committee had invited to its 1963 meeting in Honolulu representatives of engineering organizations of various Asian countries, including Japan. Negotiations with that country were expected to follow to explore the possibility of reciprocal registration. One of the Japanese representatives observed that the professional engineering system in the United States was the most successful in the world.

Other Developments in the Early Sixties

A number of other developments of note occurred in 1963:

- The Canadian Council for Professional Engineers applied for membership in ECPD.
- President-Elect William Spann appointed as a contact to each of the Council committees a member of the Board of Directors.
- The Council was beginning to formulate a syllabus for land surveying examinations.
- For the first time the Board of Directors held a meeting at a Zone Meeting. (This occurred at the Southern Zone Meeting in Mobile, Alabama.)

"An Industrial Point of View"

The year 1964 saw the Council coming to grips with the tumultuous decade of the sixties by concerning itself with the increasing complexity of our society. Speakers related that due to the increasing complexity, changes in engineering curricula would have to be explored.

Henry B. du Pont, a member of the board of directors of the E.I. du Pont Company, eloquently highlighted a number of challenges which lay ahead for the engineering profession. Addressing the Annual Meeting in Philadelphia, du Pont touched upon developments in society which affected the engineer. Speaking from what he termed "an industrial point of view," he continued President Weston Evans' earlier concern about the engineering curriculum, among other things, and suggested several ways in which the Member Boards of the Council could further strengthen its activities:

1. The industrialist stated flatly that, "The present system [of reciprocity] often results…in costly delays for industry." He urged that efforts continue to implement further the principle of reciprocity.

2. He also urged that State Boards keep well informed on trends in engineering registration and engineering practice, pointing out that registration of engineers must reflect the current educational progress and the latest scientific and technological advancements.

3. He urged that greater recognition be given to the engineering technician, who, he felt, could handle a great deal of technical work under the guidance of an engineer. Said du Pont, "Recognition by your Council of the importance of the certified engineering technician would be highly beneficial to the technician and to the engineering profession as a whole."

Discussing aspects of modern society such as space exploration, national defense, nuclear power, air and water pollution, and the population explosion and its attendant demands on technology, du Pont summed up eloquently the role of the engineer:

> Engineering is no longer a narrow specialty. As much as any other discipline, it provides the vital thrust for our national and individual progress. In this age of rapidly advancing technology, the engineer is really one of a team through which the success of science and invention reach their full human value by transforming a new idea or a new substance into something useful that can be produced for the benefit of mankind….Our technological advances are proceeding with astonishing speed, and if the past few decades are any indicator, the pace of development will accelerate even more rapidly in the future. It must be emphasized, however, that this advance of technology will not just happen. Like all progress, it must be fashioned by men of vision, talent, and perseverance. *At the center of all technological progress will be the professional engineer. It is he who must give technology its proper direction to achieve the broadest material and cultural objectives of our society*.

Henry du Pont's point was well taken concerning the role of engineering in the economy. President William M. Spann reported statistics at the same Annual Meeting to the effect that 56.5 percent of the engineers in this country were employed in "industry and manufacturing." (Spann appeared to be referring to National Science Foundation data.)

National Exam a Reality at Last

Spann felt that there were issues which confronted the "very existence and survival of professional engineering." One of his main concerns in this respect appeared to be a need for a national exam. He observed that constant and rapid changes in all stages of professional engineering activities establish complex problems in meeting the challenges to give fair and proper qualifying tests for determination of competence and ability. "The demands for qualified engineers, scientists and technicians are constantly increasing," he observed. "Many jobs are of the highly specialized variety, which increase the difficulty of the examination procedure."

It is obvious from the observations of two learned spokesmen, du Pont and Spann, that it was inevitable that a national exam would soon prevail. Spann spoke of the Council's trying to anticipate progress in technology against a background of "political reality." He appeared to be referring to the fact that the Council was composed of 54 autonomous Boards, none of which were compelled to adopt a national exam, from a purely legal standpoint. The time was ripe, however, for a unilateral move toward the national exam: the combination of such exotic phenomena as space exploration, the electronic communications revolution, and the miniaturization of computer technology were enough to convince any State Board to relinquish, figuratively speaking, a part of its autonomy in return for expertise in testing in new and exotic areas. The savings in money and manpower alone were enough to make the concept of a national exam a popular idea. More importantly, the entire field of engineering was now simply too complex to leave to the vagaries of an occasional maverick State Board in devising an instrument to determine an individual's competence in activities affecting the public welfare. Standards for determining an applicant's knowledge of bridge building had been time-tested. Standards for determining an applicant's ability to build a safe nuclear reactor required more timely input.

The Council was responding specifically with two committees: one on National Examinations under Arnold Henny, and one on Optimum Educational Requirements for Registration under Carroll Beeson.

Henny's committee had been studying the principle of a uniform exam for both EIT and professional branches, prepared under the direction of the Council and made available to all State Boards. One plan was suggested which consisted of three working components: the Secretary's office, a standing committee of the Council, and a private organization under contract or agreement with the Council.

The Secretary's office would administer the uniform examinations program. The standing committee would act in an advisory capacity and would prepare and be responsible for the format of the examination. The preparation of the problems and solutions would not be a function of the committee—they would be furnished from a pool developed by the Secretary's office. This committee would consist of four men, one from each zone.

The third component, the private organization, would work for the Council in preparing and scoring the examinations for a predetermined fee. ("It is time that the Boards pay fair rates for this service rather than relying upon donated time," the committee report stated.)

Boards would have the option of buying a master set of questions or reproduced copies and would pay accordingly. Informal inquiries by the committee indicated that the cost of scoring the EIT examination of the essay type would range from $3 to $5.

Henny's committee estimated that approximately 3,000 applicants would participate in the initial exam.

The figure applied to the EIT exam only, but it was recommended that the preparation of a branch professional exam should be initiated as soon as possible. Problems were expected because of the many separate branches tested. Henny's committee felt that the solution might be to give a single examination broad enough in scope of questions to cover all the main branches. It was hoped that the uniform professional exam would start within a year, with the preparation of the EIT exam to begin immediately, to be held in May 1965 (nine months away).

Optimum Educational Requirements Studied

Directly related to the move toward a national exam were the educational requirements imposed upon the engineer.

In 1963, the NCSBEE had appointed a Committee to Determine Optimum Education Requirements for the Professional Engineer. Its commission was to define the optimum education requirements for an engineer for the purpose of preparing him for professional engineering work, which involves the safeguarding of life, health, and property of the public and for which he must meet requirements of registration to practice engineering, as defined in the various state laws.

The committee was composed of one engineering educator and one engineer in industry, government, or private practice from each zone. Chairman Carroll M. Beeson asked each committee member to write him a letter answering the request concerning the definition of optimum requirements. The committee subsequently submitted a statement on "Educational Requirements of the Professional Engineer" at the 1964 Annual Meeting, stating that the profession of engineering "must look forward to the time when entrance to the professional ranks will require of all novitiates a substantially strengthened educational base."

The committee recommended the colleges and universities move in the direction of the following academic goals:

Formal education for the professional engineer should require one academic year beyond the present normal baccalaureate engineering programs. At least three-fourths of the baccalaureate program should be similar for all branches of engineering to emphasize the growing essential unity of the base of all branches of engineering. The curriculum for the baccalaureate engineering program should include the minimum requirements for accreditation specified by the ECPD. An additional requirement for accreditation should be that registered professional engineers have a determining role in the teaching and operation of the school of engineering. Successful completion of the studies listed in the curriculum should be recognized by the bachelor's degree in the general field of engineering which does not refer to any specific field except possibly as a subordinate reference. The additional year should be at the graduate level, and successful completion of the program should be recognized with a master's degree in a specific field of engineering. Many of the engineering courses in the baccalaureate program and more of the engineering courses in the master's program should be taught by registered professional engineers. The master's program should contain at least one-half an academic year of professional courses in the selected branch.

The committee also stipulated that each graduate student should be required to pass the EIT exam before the granting of the master's degree, which in turn should be considered the professional degree for entrance into the engineering profession.

The committee concluded that the Council should urge all its Member Boards to move in the direction which will lead to the adoption of criteria consistent with the above educational standards as a requirement for registration under the Professional Engineer statutes in the respective states.

Technological Turbulence of the Sixties

It now appeared, in the midsixties, that the engineering profession was caught up in the technological revolution which marked the last half of the twentieth century in major areas such as communications, electronics, bioengineering, nuclear engineering, and space exploration. The technological turmoil was reflected in the continuing controversy over corporate practice; the expanding educational requirements for registration; the issue of central state agencies directing all registration Boards; a proposed meeting of the Joint International Committee in 1965 of 15 invited nations to discuss registration matters of mutual interest; and joint sponsorship by the ECPD and ASEE of the proposed publication, *Problem Book on Engineering Ethics of Engineering People*.

In the midst of this turbulence, the Council would naturally be expected to keep its head and continue in its traditional orderly fashion toward the promotion of the public health, safety, and welfare. The Council's response to the chaotic sixties was to calmly index its accomplishments in the *Proceedings* of the last 38 years (a three-year task headed by Col. William M. Spann) and then to forge ahead to meet newer challenges.

International Cooperation Promoted

In 1965, a dramatic event occurred which highlighted the internationalization of technology—and therefore engineering. A malfunctioning relay switch in Ontario, Canada, caused a massive power failure covering the entire northeastern United States and parts of Canada. The episode accentuated the degree of society's dependency on technology (which is usually taken for granted on a day-to-day basis) and the growing importance of the need for competency-based registration of professionals on a worldwide scale. The blackout, which affected 30 million people, was cited in reports of a noticeable increase in birthrate nine months later. Such incidents, juxtaposed with the

capability of atomic weapons to wipe out entire nations, dramatize the life-and-death magnitude of the effects of technology in the modern world.

It is at such times that the Council's dedication is appreciated. Time after time, in reading the National Council's *Proceedings*, one is reassured by the integrity, brilliance, meticulousness, and humanitarian concerns of the persons who guided the profession of engineering.

Coincidentally, it was in the same year as the transnational power failure that the Joint International Committee reported on its program. Bruce M. Williams, vice-chairman of the committee, introduced this report by pointing out that it "…covers a great future for the engineers not only in the United States, but also the world, and we are now part of the world as well as the United States."

The committee had agreed upon a three-phase program. Phase I would involve assembling factual information on laws of licensure, governing bodies, the root of their authority, etc. Phase II would involve assembling regulatory information, e.g., regulations covering interpretations of qualifications, residence requirements, affiliation requirements, etc. Phase III would involve the voluntary elimination of unintentional and/or unnecessary barriers to the practice of engineering by foreigners.

Thus, the Council was extending to a global level the promotion of reciprocity it had begun four and a half decades before on a much smaller scale of 10 states. The language barrier alone was monumental, not to mention political and cultural differences.

Exhibiting the Council's customary empirical approach, Phase I would begin with a questionnaire sent to each country requesting information on the subjects listed above. The end result of the committee's effort would be a synopsis of laws relating to registration or licensure. This promised to be a useful compendium because of the increase in the number of engineers practicing beyond their native country.

Information was to be gathered on qualifications such as age, education, length of experience, type and extent of examinations, conditions of residence, etc. It soon became evident that even a seemingly simple task such as assembling copies of the laws from more than 20 countries would be horrendous—for example, the voluminous laws were of course printed in the native language. Committee Chairman O. B. Curtis felt that the job would not be possible within a reasonable length of time unless it was done as a joint effort of, for instance, EJC, the North American Coordination of EUSEC and UPADI, and "some help from our State Department."

First National Exam Administered

On the home front, the move toward uniformity had reached a milestone when a uniform examination in the Fundamentals of Engineering was offered twice in 1965. Thirty Member Boards participated in the historic first national exam in May of that year, fulfilling a long-established goal of the Council. The Uniform Examinations Committee had been gratified by the response of the State Boards in furnishing questions and solutions for the exam. Three of the 30 Boards taking the exam had modified a few questions to satisfy local Board conditions. Twenty Boards availed themselves of the Central Grading Service established by the committee. The EIT exam covered 10 subjects: mathematics, chemistry, fluid mechanics, thermodynamics, statics, dynamics, mechanics of materials, physics, electricity, and economics. There were three questions on each subject.

The widespread use of the uniform exam automatically was an aid to the Member Boards when considering reciprocity. The uniformity of the exam itself was important; however, lack of uniformity

in grading was a problem. As the committee reported, "Local conditions do vary and a number of Boards have found it expedient to adjust the scores in determining proficiency."

It was, of course, impossible for the committee to formulate an exam that was satisfactory to all Boards, and compromise was in order just as in all other areas of the Council's activities. What concerned some members was the possibility that the exam may have been too easy (the passing rate was approximately 80 percent at the time of the committee report). In response to this criticism President Beretta explained that had the committee presented an exam that was too difficult, the movement toward a uniform exam would have been hurt.

Compromise Reached on Section 22

A compromise was finally reached in the controversial Section 22 (the Exemption Clause or Right-to-Practice Clause) of the Model Law. At this time the original text of the 1960 clause was still part of the Model Law. So much opposition had arisen that a five-year attempt had been made to find a compromise acceptable to most engineering societies, whose input had been sought. (In doing so, the committee concluded that there were basically two types of engineering practice: consulting and industrial.)

Policy on Comity Suggested

The Committee on Uniform Laws and Procedures suggested an important policy in 1965: that registration by comity be granted provided the applicant was registered in his state of residence or principal practice and provided the requirements in such states were equal to the requirements in the state where the license was desired. The committee recommended that registration by comity was to be granted provided that requirements for registration in both states were equivalent at the time of the applicant's original registration.

Model Law and Uniform Exam Successful

The year 1966 was a temporary plateau for the Council, compared to stellar achievements in the first half of the decade such as the Model Law revision and the national EIT exam. The Annual Meeting reflected a methodical development of both those achievements along with definite progress in its other ongoing concerns.

The Model Law had inspired changes in the laws of a number of states. Fourteen states reported amendments to or revisions of their registration laws. Concerning the uniform exam, the Executive Secretary reported that the response of the State Boards had been "most gratifying to all concerned," with 39 Boards ordering the exam and 27 Boards using the central grading service (as compared to 30 and 20 respectively in the first year, 1965). These two achievements were most rewarding because uniformity of laws and examinations were at the very heart of the Council's primary goal of reciprocity.

Centralized Licensing Boards Discussed

Two societal trends were of particular interest to the Council in the midsixties. The first was the problem of centralized licensing boards. Leo W. Ruth, Jr., in his President's Report, remarked on the number of state-government publications which recommended the centralization of authority and power in a single professional and/or vocational licensing administrator or "czar," with Boards acting on policy matters only. A possible result would be the ultimate delegation of all examining

procedures and responsibilities to a commercial testing service or a civil service personnel department. "Such an arrangement would completely nullify the effectiveness of Boards in determining an applicant's competence based on his engineering judgment and experience," Ruth pointed out. At this time the Executive Secretary was collecting the various publications prepared by the Council of State Governments as well as those from individual states that had broached the subject. While the problem was not a new one for the Council, Ruth's statement was one of the strongest warnings so far.

International Council of Engineering Societies Formed

The second trend was a more positive one. William H. Wisely of ASCE reported that the "formative steps" had been taken to create a worldwide conference of engineering societies. Wisely had chaired a recent meeting in Paris sponsored by UNESCO, at which the European-United States Engineering Council (EUSEC) was asked to take the lead. Hungary, Czechoslovakia, and Russia were represented as well as the Federation of Engineering Societies of Europe. A constitution evolved which was envisioned as a framework for an organization—the International Council of Engineering Societies (ICES)—to include societies worldwide and provide for occasional meetings to exchange ideas on engineering education and qualifications for practice.

Wisely saw the possibilities of the organization providing a "tremendous lever for the advancement of international relationships" by serving as a permanent structure for engineering cooperation around the world. Copies of the Constitution were being sent to regional societies and councils for review. The profession in the United States would be represented by the various national engineering societies. Wisely reported that ideology had been no problem between East and West at the Paris meeting.

Uniform Principles and Practice Exam Administered

The Council achieved a long-held dream when its national uniform exam for the Principles and Practice of Engineering was administered for the first time in December 1966. The following spring an appreciable increase was observed when 24 Boards used the exam, with questions in the fields of chemical, civil, electrical, and mechanical engineering. These fields had been decided on as the most appropriate because they embraced the greatest number of candidates for registration.

The acceptance of the national uniform exam, along with the revised Model Law, undergirded the Council's mission of making reciprocity a reality. The Uniform Examinations Committee was now changed from an ad hoc to a standing committee. (Curiously, what seems to be a milestone in the Council's history—the administering of the national professional exam for the first time—seemed to draw little attention in the 1967 *Proceedings* of the National Council, despite the fact that years later, President William E. Carew, Jr., stated in his annual report, "NCEE's most important function is to provide examinations to Member Boards.")

Council's Name Shortened

The same Constitution and Bylaws Committee which recommended changing the status of the exams committee made two other recommendations of note at the same time. The Council's name was shortened to the National Council of Engineering Examiners, and the NBER Committee was shortened to the Committee on Engineering Registration from the original title which had been used since the first decade of the Council's history.

Another procedural change reflected the increasing workload of the Council. The Board of Directors extended the length of the Annual Meeting by one day in order to give the committees more time as a group to plan the next year's work.

A Review of Registration

By 1968, only about a third of the engineering graduates in the United States had chosen to complete the registration process. This was of concern to the Council, particularly in view of the fact that the examination process accounted for a significant portion of the Council's annual budget.

In examining the success of registration at this time, several points stand out: (1) as has been indicated, a large percentage of engineers felt that the distinction of being registered was not of value to them, (2) reciprocity among the states was still not an entirely smooth process, and (3) a debate lingered between the generalists and the specialists as to whether engineers should be examined/registered as a broad category—professional engineer—or registered as to their specialty—e.g., agricultural engineer. This latter was a problem in that testing specialties made the examination process more expensive since examinations would have to be tailored to specific subjects. This controversy prevailed at a time when the Council, which was responsible for providing test questions, was having to pay for those questions because the original plan of having engineering societies provide those questions had not succeeded.

At the 1968 Annual Meeting in Denver, Colorado, a lengthy panel discussion, "The Future Requirements for Legal Professional Recognition of Engineers," highlighted some of the problems which registration faced *vis-à-vis* the process of reciprocity. Sanford K. Fosholt, a member of a consulting firm and a member of the Consulting Engineers Council, discussed specifically the problems faced by a consulting engineer practicing in several states.

The engineer which Fosholt used as an example worked as a consulting engineer who served a company doing business in a large number of states. Fosholt reports on the plight of this individual: "The central office of that industry proposed to contract with him in State No. 1. They ask him to work with their engineering department in State No. 6. He is to design a new plant in State No. 3. He is to visit another plant in State No. 4 and make recommendations on it. He will do the detail design in his office in State No. 5. He wonders in which state he is practicing and concludes that perhaps he is practicing in all five, literally. He is registered in all five, but discovers that:

1. In State No. 1 his firm's name does not comply with the rules.
2. In State No. 6 his usual letterhead does not comply with the rules.
3. State No. 5 requires different sealing procedures from the others.
4. State No. 4 has different requirements as to who in his firm must be registered.
5. One state has different reporting requirements to the Board.

Fosholt concluded by rightly pointing out that the engineer in question wondered if all those differences were necessary "to protect the public"—the avowed mission of the National Council.

While such evidence might indicate to some that the Council had a long way to go in that mission, nevertheless, the Council had become virtually a life force in the engineering profession, providing an organization through which State Boards could "act and counsel together to better discharge their responsibilities in regulating the practice of engineering," as was stated in the 1968 *Proceedings*. For even though there were still major problems in the registration process, as Fosholt's illustration points out, the fact remains that the Council had

made tremendous strides in its efforts to regulate the profession. All states were members of the Council and had enacted laws governing the practice of engineering.

The Generalists versus the Specialists

One of the knottiest problems facing the Council was whether the registration process should aim to register all applicants as simply "professional engineer" or, instead, register applicants by specialties, such as, for example, "chemical engineer" or "electrical engineer." The two opposing points of view expressed at the 1968 Annual Meeting illustrate valid stances concerning this issue.

Five participating organizations stated official positions on one phase of President Edwin R. Whitehead's paper, "The Future of Professional Engineering Registration and Certification." These five, ASCE, ACSM, AICE, AIME, and CEC, favored registration broadly as professional engineers. For example, the consulting engineers felt that registration "should be under a single broad coverage" because many of their number are generalists who conduct large-scale and complex engineering activities, the character of which precludes narrow definition.

On the other hand, many others felt that engineers should be registered by specialties. Fosholt had expressed the view this way: "I believe that the changes in technology are really the basis of changes in practice. The fact is, as I mentioned, the projects are becoming larger and more complex, and involve more and more specialties, and therefore, I think that the registration process needs to be adapted to such changes." An example of this specialization was the American Society of Agricultural Engineers, whose representative at the Annual Meeting stated that their number one problem was the professional examination. J. H. Lillard said that the ASAE was very concerned by the fact that Agricultural Engineering candidates often had to take examinations made up of questions having little relation to their field of concentration. Lillard pointed out that the solution to this problem was further complicated by the fact that the number of AE candidates for registration by any single board likely would remain relatively small for some time to come.

It appeared that the answer to the generalist versus the specialist controversy would lie in more economic testing procedures, probably multiple-choice, machine-graded exams. (Just one year later, the Council entered into a contract with the Educational Testing Service to prepare a four-hour multiple-choice exam which was to be compared to the subjective exam then in use.) The proliferation of specialties and the increasing complexity of engineering practice would not allow this problem to go away. Moreover, the interests of the Council were expanding on a global scale, for the Board of Directors recommended at the Annual Meeting that the Council apply for membership as one of the group of societies in the USA national membership in the World Federation of Engineering Organizations, a concern of which was the evaluation of qualifications.

The "Explosion of Knowledge" Affects the Council

In 1969, President George F. Branigan met head on the issue of registration in his annual address. Our astronauts had, less than two months before, set foot on the moon at Tranquility Base, prompting Branigan to pose the awesome question, "How many of us thought that only 66 years would elapse between the first aerial exploits of the Wright Brothers and Neil Armstrong's and Buzz Aldrin's walking on the moon?"

Branigan's question highlighted the plight of the Council and professional organizations—how to keep abreast of the proliferating knowledge required by engineers and scientists? The president pointed out that many who had graduated before 1950 (only 19 years prior) had probably not studied

such subjects as nuclear physics, computer technology, bio-medical engineering, computer-aided design, and other subjects which had become timely. Now, in 1969, the quintessence of technological achievement had been reached at Tranquility Base, and it is probably safe to say that the accomplishment was the result of the work of a veritable army of engineers.

The significance of these developments for the Council was that the increase in technical knowledge had resulted in a proliferation of engineering curricula, "despite some opposition in accrediting organizations." This position, according to Branigan, developed principally because of the difficulty of recruiting inspectors for the accreditation of curricula that did not fit the pattern of existing technical societies such as the ASCE, ASME, IEE, etc. Branigan further stated that, "Some groups…have pointed out that licensing, by its establishment of standards and minimum requirements, may have imposed some restrictive influence on education by encouraging rigidity and fixed norms."

The same problem which applied to the accreditation of curricula applied to the registration of professional engineers. State Board procedures often did not provide for the licensing and registration of many of the newer branches of engineering.

Perceptions of Registration

W. Morgan Allen, who succeeded Branigan as president, had convened a group of engineering industrial leaders in Chicago in April 1968 for the purpose of exploring engineering registration (and discussing the reasons why less than 40 percent of engineering graduates in the United States become registered Professional Engineers). Subsequently a committee was formed to study "The Future of the Professional Recognition of Engineers." This group consisted of representatives from heavy industry, light industry, public utilities, environmental engineering, aerospace industry, education, consulting, and the engineering societies. Rex A. Tynes of the Nevada Board was chairman.

In an interim report at the 1969 convention, the committee reported on the perceptions of unregistered engineers. The comments of that committee are pertinent today.

The committee observed that for several years, engineers had become increasingly concerned over a precise identity for the engineering profession, which was subdivided into a number of categories including engineering graduates, members of various engineering and professional societies, licensed engineers, and persons who held the title "engineer" in the place of employment. The committee saw the problem as being complicated by the fact that during the next two or three decades, "…there will be such rapid changes in technology that the varieties of engineers will increase, thereby seriously increasing the potential of confusion in the minds of the public as to the recognition of the engineer."

The committee pointed out that when the registration movement originated, licensing laws were directed mostly toward the design of static structures such as bridges, highways, and buildings, but that in the 60 years since that time, the main emphasis of those laws had not changed and at the time of the committee report, had little relevance to the design of dynamic systems and other significant engineering developments of the past half century.

While engineers in private practice were required by law to be registered, a majority of engineers in industry, government, and education did not bother to seek registration. The committee offered several reasons for this situation.

1. Because the minimal educational requirements and the examinations did not recognize what had happened to the practice of engineering in the preceding decades, they were inadequate for the

purpose of screening out any but the "grossly inadequate would-be engineer." Hence, many engineers felt that a registration certificate conferred "no particular status of quality on the holder," nor did it protect the public or the engineer's employer from the marginal practitioner.

2. Because the registration examinations were generally restricted to specific fields of engineering, as contrasted with the way in which engineering was then practiced in industry, the requirements tended to exclude or discourage many competent persons who came to the profession from related science disciplines.

3. Industry is more likely to confer responsibility on those who demonstrate competence firsthand, rather than those certified through a one-time examination. The products of industry must speak for themselves, rather than through certification of persons producing them, and this procedure more stringently protects the public than statutory registration procedures.

4. Many of the registration statutes, in the eyes of unregistered engineers, appeared to be in part "more concerned with the protection of the profession," than the protection of the public.

The committee concluded, "It is clear that neither the engineering community nor the public at large has accepted registration as the sole criterion for identifying who is, and who is not, a member of the engineering profession."

The final report of this committee was presented at the 1970 meeting of the Council. The committee recommended a number of steps on which Council action was requested, the most important of which were:

1. That the profession should strive, during the next 20 years, to bring requirements for engineering education into line with professional needs.

2. That the first professional degree in engineering should become a mandatory requirement for entry into the profession.

3. That recognition as a professional may be attained by either of two routes—through the various State Boards or through a coordinating agency to be established by the engineering societies for accreditation.

4. That licensing of engineers by narrow branches, or classifications, should be discontinued in favor of licensure simply as a "Registered Engineer."

5. That a system of universal comity should be established by the State Boards which would provide for the convenient registration of the qualified engineer who fulfilled in good faith all the requirements of his state at the time he became registered and which equaled or exceeded the requirements on that date of the state in which registration by comity is sought.

6. That the term Engineer-in-Training be dropped, and persons entering the profession be identified as engineers.

7. That the Model Law Committee be requested to incorporate in the next edition of the Model Law the appropriate provisions of the report accepted by the Council.

A Golden Anniversary Celebration

Thus, at the time of the Council's 50th anniversary, the organization could look back over the years and observe many successes, especially concerning its avowed role as a forum where the various states could discuss mutual problems; there was no question that after a half century of dedicated and selfless service on the part of countless members, the Council had established its credibility in the profession of engineering in this country.

Executive Secretary James H. Sams, in his report at the 1970 meeting (the Council's golden anniversary) summarized the following achievements of the Council's 50 years of dedicated effort.

Minimum standards had been established for registration and had been continuously reviewed and raised as deemed necessary for the protection of the public. The Council had urged and assisted in the formation of ECPD to set minimum standards for engineering education in the United States and continued as a constituent body of ECPD. Uniform laws and procedures had been recommended to aid in interstate registration of engineers. More and better law enforcement had been recommended. A service had been established for verifying the professional records of engineers who needed to be registered in a number of states. The Model Law had been periodically revised to serve as a guide in updating and including more uniform requirements in state laws. An examination service had been established to assist Member Boards in providing better-written examinations.

These were particularly outstanding accomplishments when one remembers that the Council was the negotiating body of 55 different political entities. Moreover, while a large percentage of engineers were not registered, it is well to keep in mind that approximately 242,000 *were registered* at this point in history. Further, the national uniform exam was used in a majority of the states, with 41 using the EIT exam and 34 using the PE exam provided by the Council. The number of states using these exams had increased significantly each year since their inception.

Now, however, the Council was confronted by new challenges: attracting those engineers who had not yet registered; the splintering of the profession into new occupations and academic disciplines; and acceleration of the process of comity in a profession that was becoming increasingly mobile.

But perhaps the most profound challenge which beckoned the engineering profession at this time was a more complex one. The awesome technology which had been amassed by the beginning of the seventies presented still newer issues for the engineer, i.e., what would be his role—activist or objective technician—in the problems which the world would soon have to face; the horrendous problem of environmental pollution; the course of space exploration; war machinery of unprecedented danger; bioengineering's unknown consequences; and other technological developments which Council leaders had addressed as early as the post-World War II meetings.

At the beginning of the 1970s the Council had achieved a large number of its goals, with the Model Law as its magnum opus. The one concrete goal remaining was the national uniform exam, and in the early seventies the Council quickly achieved that goal, with a standardized, machine-graded exam in the Fundamentals of Engineering.

Generalist versus Specialist Registration

In 1971, the effects of the Information Age on the Council could be seen in the issues of generalist versus specialist registration and the evaluation of engineering technology curricula.

There is no question that the third quarter of the 20th century saw what Thomas Kuhn calls a "paradigm shift," that is, a scientific perspective from an entirely new frame of reference. This was brought about largely by the invention of the microchip, which inventor J. A. Morton of Bell Labs said freed scientists from "the tyranny of numbers." In other words, the scientific world was now able to develop the technology in the real world, which it had known how to do all along, except for the inability to handle the prohibitive amounts of information—enormously complex calculations, etc.—necessary to apply abstract theory to the real world. (There were other developments, to be sure, such as the development of nuclear science, but here, too, computer technology was necessary to undergird it.)

The effect upon the Council was that it had to deal with swift developments in the way in which science was "practiced." New specialties proliferated—computer technology, nuclear engineering, avionics, space technology, bioengineering, and others undreamed of by the Council's founding fathers.

The result, of course, was that the Council had to come to grips with how to evaluate new curricula and new kinds of experience in the workplace. This challenge was seen in several aspects of the 1971 meeting.

Criteria Developed for Technology Programs

The ECPD reported that accreditation criteria were being developed for various technology programs in curricula which had come to be called "Allied Engineering Professional" curricula. The ECPD further established a strong Coordination Committee with proposed standing committee status, whose membership included representation from the Engineering Education and Accreditation Committee and the Engineering Technology Committee. It was charged with "seeking cooperation between the two committees in the development of projects, establishment of common procedures, common involvement of the participating bodies, and achievement of coordination in the development of criteria for accreditation." The EE&A/ET committee was given the authority to develop differential criteria for accreditation of advanced professional programs beyond the baccalaureate degree, that is, at the master's level.

The term Allied Engineering Professional Curricula was defined as including two-year associate-degree programs in engineering technology and related programs such as the baccalaureate degree in industrial technology, the accreditation of which was being carefully studied.

In the preceding year, the Engineering Technology Committee of the ECPD had evaluated 94 curricula at 27 institutions. Of those institutions, 15 offered the associate degree and three the baccalaureate. Nine offered both the associate and master's degrees.

Dean Harry C. Simrall of Mississippi commented that the NCEE/ECPD Committee recognized that "the matter of education in engineering technology curricula presents a problem to the State Boards in evaluating such education as a part of the qualification for registration…." The committee therefore recommended that the Council refer the matter to the Qualifications for Registration Committee for study to determine the amount of educational credit to be allowed for both the four-year ECPD-accredited and nonaccredited engineering technology curricula and two-year ECPD-accredited and nonaccredited engineering technician curricula.

Nor was it only in the area of curricula that the issue of engineering technology was felt by the profession. In a statement before the Participating Organization Liaison Committee, Chairman Phillips Bill of ACSM spoke on the growing authority of technicians to render engineering services. It was his belief that the main reason "technicians' activities within our profession seem to be entering the field of professional engineering is that we have never been able, or perhaps willing, to identify clearly the character of this complex [sic] that we call professional engineering." Bill pointed out that the practice of engineering is essentially "a complex team of which we are at best the coach and general manager." Continuing this analogy, Bill described the recent development of engineering technology as essentially an "in-house" responsibility. High school graduates were hired and "taught as much as they needed to know to serve our purpose…." More recently, the development of community, junior, and regional colleges had provided opportunities for the two-year degree for engineering technicians. However, Bill pointed out, these college-educated technicians had no more right to practice than before.

The other side of the coin was that persons with the traditional engineering degree were being assigned technicians' tasks. Bill asked the following question, as he explained the blurring of lines between the professional engineer and the technician, "How often has a graduate of a four- or five-year course in engineering eagerly accepted his first employment only to be plunked down at the (drafting) board and assigned the obviously technician task of copying standard specification forms of structures? How often has the same type of graduate been hired as a potential professional only to be shoved behind a transit, an obviously technician task, for a couple of years…." To Bill, the real threat inherent in the engineering technician issue was not the threat from any sort of competition, but rather that the profession itself had failed to distinguish between "the professional and the technician responsibilities on our team." He pointed out that the technician could assume professional status only by fulfilling requirements set down by the State Boards and that the responsibility of the profession is to make sure that those requirements are clearly understood and of high enough quality to genuinely protect the public interest.

Zone Meetings Attract More Delegates

At this time the Council marked a critical development: the four Zone Meetings prior to the 1971 Annual Meeting attracted 154 delegates from 49 of the 55 states and territories, whereas the national convention, by comparison, attracted 125 delegates from 47 Member Boards. This apparent decentralization resulted from the facts that the Zone Meetings were presenting very meaningful programs, and attendance at the Zone Meetings was cheaper for the delegates than attendance at the national conventions.

At this national convention, two social movements were discussed which were particularly pertinent to the engineering profession: consumerism and environmental protection. William A. Sowers, president of CEC-USA, discussed "The Effect of [consumer advocate] Ralph Nader on the Practice of Professional Engineering." Sowers was responding to a *New York Times* article which he felt contained a challenge by Nader "for us to make technology more humane as a condition of its use." Sowers said that Nader made three points: (1) that engineers in industry and government had shown no professional conscience beyond that required by the employer, (2) employed engineers who had acted otherwise had suffered reprisals, and (3) there was no collective action to defend or support the individual engineer who did speak out. Nader offered three suggestions: (1) that federal laws were needed to protect employed professionals from such reprisals, (2) that professionals organize to force management to adopt process procedures which could be legally enforced, and (3) that professional societies support individuals who called attention to questionable corporate or governmental action.

It was not surprising that Phillips Bill would take the profession to task for failing to delineate clearly the border between engineering and technology. Both terms are open to debate: some members of the Council would have abolished the term Engineer-in-Training as demeaning, for instance, while the difference between a technologist and a technician seemed to be defined primarily by the type of degree held; moreover, while many might define the term engineer as "one who is licensed to practice engineering," there still remained the fact that there were many practicing engineers in industry who were not required by law to be licensed.

In any event, the profession continued to grapple with the issue of engineering technology.

The ECPD Committee defined engineering technology as "that part of the technological field which requires the application of scientific and engineering knowledge and methods

combined with technical skill in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer, at the end of the spectrum closest to the engineer." It included such work as drafting, construction, operation and maintenance of plants, sales engineering, servicing and testing of materials, etc. The U.S. Bureau of Labor Statistics had predicted a 64.5 percent increase in employment of technicians between the years 1966 and 1980. The need for proper evaluation and distinction between the technician and the engineer in the licensing or registration process was rapidly compounding the work of the registration Boards all over the country. Most state laws had as one alternate route to registration a bachelor's degree in engineering from an approved curriculum. A Special Study Committee on Technicians and Technologists stated in 1972 that "…Many of the new technology graduates now approach registration boards and proffer their ECPD 'degrees' as evidence of qualification. The problem becomes myriad when the procession is joined by those who hold both two-year and four-year similar degrees from institutions accredited by other approval agencies and numerous others which have no accreditation status."

Technology Credits Vary Widely

The implications for the Boards were obvious: the committee through a questionnaire discovered that there was a tremendous spread between Board policies and credit allowed for technology education, ranging all the way from 0 percent to 100 percent. The committee concluded, "…we have a rather serious problem, especially when attempting to evaluate applicants with technology and technician backgrounds for reciprocity or comity licensing." It was thought that the problem could rapidly grow worse unless NCEE could arrive at some guidelines that were reasonably acceptable to all concerned. The Committee echoed Bill's point that a clear distinction had to be made between the engineers and the technicians and that the profession and the NCEE should help with this clarification.

In the meantime, the number of requests for examinations had doubled in three years. Now, in April 1972, a total of 13,000 Fundamentals of Engineering exams and 5,000 Principles and Practice of Engineering exams were given. This increase in activity was called unprecedented by President Anthony L. Bavone. More important perhaps, and more indicative of the changes that the profession was going through at this time, was the fact that the Uniform Examinations Committee had worked to increase the number of fields covered in the principles and practice area and to achieve uniformity in the grading process.

ICOR Provides Closer Liaison

Still another indication of the changes that the profession was going through was the rivalry between architects and engineers. Seeking to meet that problem head-on, the Interprofessional Liaison Committee recommended the formation of an Interprofessional Council on Registration (ICOR) to develop rules of conduct which would provide closer liaison between the professions. (Bavone termed this "probably the most important…thing that occurred during my administration.") The committee recommended that the NCEE join with the National Council of Architectural Registration Boards and the Council of Landscape Architectural Registration Boards to open lines of communication at the highest levels to ensure continuing exchange of information and cooperation.

Board Members Participate in Accreditation Visits

An important "first" was witnessed by the National Council in 1972: the Engineering Education and Accreditation Committee of ECPD instituted a policy of inviting observers from State Boards to accompany ECPD evaluation teams on accreditation visits to colleges and universities within their states. Prior to 1972, an educational institution could request permission from the appropriate regional chairman to allow an individual to serve as an observer. The team chairman had final authority to approve or disapprove an observer—a decision normally based on how busy the team would be. With the advent of a federal agency revising all of ECPD's policies relating to accreditation, there came an amended policy whereby the ECPD invited *observers*.

New Trends in Registration Arise

The year 1973 ushered in a number of ongoing problems along with the engineering technology dilemma, including the question of continuing education requirements, professional ethics, minimum cutoff scores for exams, etc. One of the most interesting developments, however, related to a subject which had been the *raison d'etre* of the Council 53 years before: registration of engineers.

At the Northeast Zone meeting two significant developments were discussed. A new Delaware law, the first of its kind in the country, charged the Delaware Society of Professional Engineers with the responsibility for registration and maintenance and enforcement of the standards which it represented, creating, in effect, a self-policing of the profession. This law was looked upon with great interest because of its potential for creating a new trend. At the other extreme, however, was a proposed Massachusetts law which would take the responsibility of registration out of the hands of the profession. The General Assembly had considered a bill which would create a cabinet structure with 27 registration boards administered by a secretary of licensing and registration who would pass on the education and qualifications of the applicant. The engineering registration board would be only an advisory board meeting once a year. The engineers in Massachusetts were understandably concerned about the effect which such conditions would have upon reciprocity.

(Editor's Note: As of 1986, the number of umbrella organizations is increasing, and their scope of authority varies widely. For instance, in Tennessee, the Land Surveying Board is under the authority of the Department of Agriculture, while in Illinois, "licensing committees" are under the Department of Occupations and Licenses.)

Southern Zone Adopts Universal Comity

While Massachusetts was grappling with this apprehension, the Southern Zone scored a stunning success for the cause of reciprocity when it adopted a Declaration of Universal Comity. This meant that all states of the Southern Zone agreed to license by comity those registrant-applicants in good standing who had met the qualifications of graduation from an ECPD-accredited curriculum, satisfactory completion of 16 hours of approved examinations, and a minimum of 4 years satisfactory experience in engineering practice. At least in the 13 Member Boards of the Southern Zone, a dream of the Council's founding fathers had come true. This action illustrates the wisdom of the decentralization of Council activities into groups the size of zones—small enough and homogeneous enough to reach such an agreement which had eluded the Council *in toto*.

The Council could boast another milestone along with the comity resolution of the Southern Zone: the first uniform examination in the Fundamentals of Land Surveying was offered in April

1973, with 10 state registration Boards using it, and several more indicating that they would soon use it. Subject matter included mathematics, physics, English, surveying, property surveys and descriptions, vertical curves, state plane coordinates, and economic analysis. It was the conviction of the Land Surveying Committee that the uniform exam would better serve the public interest and simplify the problems of comity registration between states using the exam. The committee also at this time stated that it would offer a motion requesting the Council to instruct its ECPD Committee to solicit ECPD to assume the responsibility for accreditation of post-secondary school curricula in surveying.

In 1972, the Council approved a total revision of the National Engineering Certification Program. It was the opinion of the committee that the revision was progressing toward its goals of providing a program which would hold more value for the practicing engineer, increase his prestige, and aid his receiving comity among the several states. The committee reported that in 1972 income derived from the activities of the committee had increased 40 percent more than the previous year and that the 1973 income was expected to exceed that of 1972.

Council Faces Insolvency

In the mid-70s the Council had to address an internal problem that appears to have been developing for several years—insolvency. As the officers and directors began to become more aware of the true extent of the problem, and require more detail from the Executive Director, several critical defects in financial procedures were identified, including such factors as:

- Lack of adequate controls. There were no accurate monthly or quarterly reports provided to permit the Finance Committee or Board to monitor status.
- Budget system loose and ineffectual, with inaccurate projections of income and expense.
- Expensive, ill-timed, and unprofitable ventures in new areas, such as developing a training film for the PE exam, developing a new exam for the American Concrete Institute, and others.
- Uncontrolled increases in charges for Educational Testing Service (ETS) services for the examination program. (The Board of Directors cancelled its examinations contract with ETS on the assumption that the examinations, if done in-house, would cost less. A full-time director of examinations was hired, but the program did not prove successful, and the ETS contract was later reinstated.)
- Leaving the total financial process mostly up to the executive director and the inability of the Finance Committee to get hard accurate data.
- Extensive and uncontrolled travel expense for staff and committee meetings. (For example, travel expense jumped from $27,585 in 1972 to $42,079 in 1973 and then to $77,308 in the original 1974 budget.) It was felt that one way the reduction could be accomplished was by having the chairmen of the committees meet with the executive staff at Council headquarters in Seneca rather than have the entire committee present.

To further complicate the problems, the practice for many years had been to end the fiscal year December 31. With the Annual Meetings in August, and no accurate interim reports, it was very difficult for anyone to tell where the Council stood. The new Board coming in August each year did not really learn the true financial situation until well into the year, when it got the previous fiscal year report. (Because of many years of use this was difficult to change, but the Council eventually revised it in 1980 and adopted a fiscal year ending August 31.)

The overall severity of this period in the Council's history can be seen from the table below.

Comparison of Financial Operations

Fiscal Year (ending 12/31)	Income $	Expense $	Gain or (Loss) $
1973	426,788	470,820	(44,032)
1974	604,617	666,072	(61,455)
1975[1]	724,756	644,524	80,232
1976[1]	957,657	590,528	367,129

[1]Adjusted, per Treasurer's Report, for $65,210 exam billing

From the above, it is clear that the Council not only spent some $44,000 over its income in 1973, but the deficit increased to over $61,000 in 1974. Even though there was a reserve of some $60,000 at the end of 1972, this had been borrowed against to the limit, and a crisis was at hand.

When this critical situation first became fully apparent to the Board of Directors at the August 1974 meeting of the new Board, some immediate steps were taken. The Board established an ad hoc Executive Committee of President Fine, President-Elect Moench, and Vice President Stivers, with authority to oversee the financial operations of the Council office and to coordinate for the Board with the Finance Committee. Because of proximity to the Seneca office, Stivers was designated by the committee to maintain close contact with Executive Director Edelblut, including visits to Seneca, and to establish and require whatever controls and reports that were indicated to operate within the new budget. At the August meeting it had appeared that FY 74 loss could run over $100,000. Although expenses were cut drastically during September through December, such large losses had already occurred prior to August that the Council eventually posted a loss of $61,455 through December 31, 1974.

Throughout the 1974–75 Council year, every effort was made by all concerned to work through the executive director to carry out the agreed financial guidelines and programs developed by the Finance Committee and approved by the Board. While great progress was made, it was clear by the time of the 1975 Boston Annual Meeting that more drastic actions were required.

Consequently, at the 1975 Boston meeting, following review by all concerned of this critical financial picture, the executive director was terminated, and a long-time employee, Mrs. Lorraine K. Cauthen, then current Assistant to the Executive Director, was appointed as Acting/Assistant Executive Director. Mrs. Cauthen continued very effectively in this role from August 1975 until Past-President Fine became full-time Executive Director in the spring of 1976.

Also, at the Boston meeting, President Fine appointed President-Elect Stivers to continue as Financial Liaison Officer for the Board for the Council year 1974–75. (At this time, he was involved with essentially the same authority and responsibilities that were later, in 1976, assigned to the new office of Treasurer, and increased coordination was developed between the Finance Committee, the Board, and the staff, along with increased reporting frequency.) In addition, the new Board approved sharp cuts in staff and expenses. A $40,000 personally guaranteed loan was arranged, through a dedicated member, to pay critical bills and tide the Council over until new revenues from the increased exam fees could be generated.

For those interested in more detail on this period, the Finance reports, along with reports by President-Elect Moench and Vice President Stivers in the 1974 *Proceedings* give the overall picture. In addition, the comparable reports, and accompanying appendices, in the 1975, 1976, and 1977

Proceedings document the details of corrective steps taken and the financial revival of the Council. In addition to those already mentioned, some of the other major items were:

- Establishing proper controls, including improved reporting forms, monthly and quarterly reports, and closer monitoring by Board and staff. (At one point in the 1974–75 crisis, daily bank balance and weekly cash position sheets were sent to the Board Liaison Officer.)
- At the 1974 Annual Meeting, the cost of PE exams was increased to $10 for 1975 and to $12 for 1976. The Board later decided at their May 1975 meeting to go to $15 beginning with the April 1976 exam.
- Recognition that an additional officer was needed on the Board, for financial control, since the Southern Zone Vice President or President-Elect, or Finance Chairman, could not be asked to assume these extra duties continuously. The Board and Council voted at the 1976 Annual Meeting at Tucson to add the office of Treasurer, and Waldemar Nelson of Louisiana was appointed by the new Board to be the first Treasurer.
- Development by the Treasurer and the Finance Committee of new financial procedures and subsequent adoption of these into the Bylaws.
- The Board voted the addition of a new Administrative Assistant for the Executive Director, with major time to be spent on implementing the new financial procedures.

In summary, for the period 1973 through 1977, it appears that we learned our lesson well. As outlined later herein, all subsequent years have shown a positive margin, and the Council has established and maintained an adequate reserve fund.

The basic cure came with the realization that the Council must charge enough for the examinations to cover the true cost of a quality program and then establish and manage that program efficiently. Even more basic was the recognition that "eternal vigilance is the price of success" and that the elected leadership must constantly stay involved, "mind the store," and never get to the point where they let the operation and policy of the Council fall back totally on the staff, no matter how competent and dedicated that staff may be.

Evaluation of Engineering Technology Education

A primary concern of the Council for some time had been the question of how to evaluate engineering technology education. A special Ad Hoc Committee on Engineering Technology Registration had been appointed in 1973 to examine engineering technology programs and make recommendations on how persons enrolled in or graduated from such programs should be considered in the engineering registration process. The study was initiated primarily because of the multitude of ways various State Boards were dealing with graduates and/or students enrolled in engineering technology programs when these persons applied for registration as an engineer. It was believed that in order to minimize confusion and difficulties in comity or reciprocity, a uniform policy should be developed which all Member Boards would, hopefully, adopt and follow.

The committee pointed out that in the past few years, four-year engineering technology programs had been growing at universities and colleges throughout the nation. Concurrently, industry and business were seeking an increasing number of persons trained as engineering technologists and technicians. Although the engineering technologists had training in engineering-related fields, they lacked education in mathematics, physics, chemistry, engineering theory and design, and the engineering sciences. Moreover, although such curricula might be

ECPD accredited, the teams accrediting the technology curricula were different from the teams accrediting the engineering curricula.

To enable the Boards to take immediate action to arrive at a uniform policy for evaluating technology education, the ad hoc committee proposed a short-term policy which fell within the midrange of the credits then being awarded by the various Boards. Its recommendations provided for a maximum of two years' educational credit toward registration for a graduate of an ECPD-accredited four-year engineering technology curriculum and a prorated credit of one-half year of credit for each year satisfactorily completed by a non-graduate up to a maximum of two years. It provided a maximum of one year of credit toward registration for a graduate of a non-ECPD-accredited four-year engineering technology curriculum, with no credit for a nongraduate of such a program. A two-year technology graduate received no credit.

The committee went on to point out the evolvement of higher forms of science and engineering over the past 20 years and the greater dependency of the public upon the professions "have brought a new dimension to the education required to equip modern-day engineering practitioners with not only the tools of excellence in knowledge and learning, but also the basis from which serious and important judgments could be properly exercised."

In order to continue high standards in engineering education, the committee went on to recommend a long-range policy which stated that a fixed date should be established eight years hence after which no one would be considered for engineering licensure unless he had first acquired at least a four-year bachelor of science degree in engineering from a curriculum approved by the ECPD. This objective was in keeping with many of the latest revisions in state registration laws and the policies proposed by various professional groups.

The Council adopted both of these resolutions.

Rules of Professional Conduct Adopted

A second issue which the Council resolved in 1974 was that of whether or not the concept of professional ethics should be included in the Model Law. The Model Law Revision Committee voted unanimously that they should not be a part of the Model Law. However, it was felt that a suggested set of rules and regulations should be published as a supplement to the Model Law. These "Rules of Professional Conduct for Professional Engineers" were adopted by the Council. The rules addressed such matters as limiting practice to the engineer's area of competence, the proper use of seals, a ban on the use of competitive bidding, conflict of interest, and other ethical issues of concern to the profession.

Shortly before the 1977 Annual Meeting in Atlanta, the Council office received a communication from the U.S. Department of Justice, requesting voluminous information regarding the development and implementation of the NCEE Code of Ethics and Rules of Professional Conduct. They were particularly concerned about the provisions relating to competitive bidding.

The matter was discussed by the President and Executive Director in various telephone conferences with Board Members, and the Board agreed to refer the entire matter to our legal counsel, Jerry Fedder, for handling. Subsequently, Mr. Fedder recommended we rescind the NCEE Model Rules of Professional Conduct on the grounds that such Rules are state functions and should not be a part of NCEE procedures. He also recommended we go into Executive Session at the outset of the Annual Meeting to fully discuss and develop actions on this matter. The 1977 *Proceedings* show that subsequently the Board agreed to follow this recommendation, and the Council passed

motions at Business Sessions II to rescind the Rules and to give the Board of Directors the power to act on the matter between Annual Meetings.

Continuing Professional Competence Addressed

During 1973 the Council had been asked by the California and Iowa Boards, whose legislatures were pressing for immediate proposals concerning this issue, for help in responding. It was assumed at the time that other states would shortly follow suit.

In late 1973, to develop a response, President Orland Mayer assigned the Uniform Laws and Procedures Committee, chaired by Christian Grosser of Virginia, to study this matter, and they conducted a survey of professional societies to gather information. The key meeting of this committee was held in Chicago in December, 1973. Review of the survey showed minimum support for "mandatory" Continued Professional Development and indicated more study was needed. Whereas the committee began the one-day meeting with the feeling they had better develop a program at once, by the end of the day they completely reversed their thinking and concluded much caution was indicated. Their report recognized such factors as (a) discriminatory inequities due to applying the rules only to 300,000 licensed P.E.'s and leaving unregulated the approximate 900,000 unlicensed P.E.'s; (b) potential high cost to the public; (c) probable reductions in registration; and, (d) problems of uniformity, portability when moving between states, and reciprocity.

Based on subsequent studies, the Uniform Laws and Procedures Committee reported at the 1975 Annual Meeting that political movement in a number of state legislatures had been aimed at imposing mandatory requalification requirements before periodic license renewals; these requirements primarily focused on continuing education. The origins, the committee pointed out, had been consumer advocate groups acting under the conviction that the public was endangered by professionals neglecting to keep up to date in a period of rapidly changing technology. According to the committee, "The notion took the public's fancy and political capital was quickly made by opportunistic legislators. Educational efforts by professionals followed, aimed at highlighting the 'complexities attendant on such requirements and the grave dangers of unjustly depriving individuals of their livelihood.'"

The committee's inquiries to the societies elicited responses which indicated that of the 15 societies which responded, a majority of 10 disapproved of mandatory requirements for a number of reasons, among them that professionals were thought to maintain their own competence as a matter of ethics in the marketplace, that competence could not be measured by monitoring continuing education efforts, and that no adequate standards existed for evaluating continuing education activities.

With these responses and supporting evidence from a number of intersociety meetings, the committee proposed (and had adopted) seven recommendations, among them one which stated that "…continuing education engagements by the individual should be voluntary, stimulated and organized from within the profession." The committee recommended that Boards vigorously oppose mandatory requirements for reexamination as being unfeasible and entirely unnecessary. The committee further recommended that if Boards were forced by legislatures to add mandatory requirements for renewal, then continued practice be made the primary criterion of competence.

Uniform Exam Problems

The Council's examination process suffered a number of problems in 1975, the most serious of which perhaps was the number of errors in the April examinations, evidently because the exams

went to press "without adequate review," according to the Uniform Examinations Committee. (The Fundamentals of Engineering Examination was the first UEC effort following the cancellation of the ETS contract.) A special ad hoc committee was established to study the problem. It is interesting to explore this unusual phenomenon—the Council often took a long time to bring about successes but seldom blundered.

The ad hoc committee was charged with reviewing all examinations administered in April 1975. President Morton Fine requested that all defects, responses, faulty instructions, etc. noted by those administering the examinations be reported. Following are the major problems reported:

- FE a.m.—Complaints were received on 28 questions, 7 of which were invalid due to faulty or inadequate information.
- FE p.m.—Complaints were received on 21 questions of which 1 was invalid and 7 others were being reviewed at the time of the committee report.
- PE a.m.— Complaints were received on 8 questions. Two were corrected with errata sheets prior to the administration of the exam, and 1 other required further review.
- PE p.m.—Complaints were received on 11 questions. Two questions were found to be invalid and under review.
- Land Surveying—Complaints were received on 15 questions. Two questions were invalid. One was under further review. Other complaints in all of the above categories of exams were deemed not serious enough to invalidate the questions.

The ad hoc committee directed that credit be given to any answers to the invalid questions. The committee further stated that "an excessive number of typographical errors as well as errors in content" were found in the exams, most of which could have been discovered by reasonable proofing and content review. There was excessive use of abbreviations and language terms not generally known or universally accepted by engineers. Several states noted that pages were missing from the FE exams.

It was obvious that the decision to prepare all examinations in-house by NCEE staff was a serious mistake. It was further obvious that a higher degree of care would have to be exercised by the staff to assure that future examinations would enjoy the confidence of its Member Boards and candidates taking the examinations. During this time, several states, including some of the larger users of exams, had expressed their displeasure with the examinations and their desire to withdraw from the Council's examination program. A number of significant changes were implemented, including a return to the Educational Testing Service for the Fundamentals of Engineering Examinations, a shift in responsibility for examination preparation from the NCEE staff to the Examination Committee members, and changes in NCEE examination senior staff. While significant, these changes were just the beginning of the turnaround in the examination program. President T. E. Stivers and Examination Committee Chairman Roger Brown succeeded in obtaining a commitment from the dean and faculty of the Georgia Institute of Technology to prepare two complete Principles and Practice of Engineering Examinations. This gave the Examinations Committee the necessary time to reevaluate the entire examination program. The committee reviewed the status of the examination question bank, exam usage by discipline, and methods to secure more participants in the preparation of examination questions.

As a result of the review of examination usage, the committee recommended and the Board of Directors approved the separation of the Principles and Practice Examinations offered to Member Boards into two examination booklets. The first booklet included the most frequently used

examinations. The second booklet included the least used exams, which, ultimately, were offered to the Member Boards only once a year rather than twice a year.

Fiscal Reform

During the 1975–1976 year, the Council's primary focus was directed toward regaining financial stability. The close call with economic ruin required a complete revamping of financial policies and procedures. Under the leadership of President-Elect Ted Stivers and Treasurer Waldemar Nelson, the Committee on Finances developed "Guidelines for Fiscal Control." Later these guidelines were to be adopted as Council Financial Policy.

The implementation of the guidelines required revision of the governing Bylaws to include a new "Part 7 Finances." The new sections contained detailed instructions for conducting the Council's financial affairs. The Committee on Finances was given surveillance responsibility over all financial activities of the Council. Included in the charges were new sections on financial reporting, dues, budget preparation, budget projections, budget deviations, and budgetary authorizations of staff positions and salaries. These changes issued in a new era for the Council as recognized by President Herman A. Moench in his annual report to the effect that the Council has "turned the corner."

Proportional Voting Debated

The most important issue addressed by the Constitution and Bylaws Committee was that of proportional voting (that is, allotting the number of votes a Member Board had in the Council based on the number of registrants in the state of the Member Board, as contrasted with the one-Board one-vote system).

Because there was a division of opinion among the C&BL Committee on proportional voting, two members agreed to write position papers expressing the opposing sides of the issue.

D. C. Klein of Texas, explained his pro position that while more complex vote-counting and shifts of power brought about by proportional voting might present problems, nevertheless it appeared that, based on a sliding scale presented at the spring 1975 Southern Zone meeting, the proportion of money from fees from states which would have more than one vote would equal the relative voting strength of the Boards when they were combined. That is to say, voting power would increase as the amount of money paid by the Boards increased. Klein therefore recommended proportional voting.

On the other hand, William E. Moore II of West Virginia, in an opposing paper, stated flatly that voting in proportion to the numbers of registrants under the jurisdiction of Member Boards constituted a "radical change in the philosophy of registration and the purpose of the NCEE." Moore felt that the long-term effect would be to make the Council a "professional society instead of an organization of state regulating bodies." The basis of his objections appeared to be that the Member Boards are responsible to the *governments by which they are appointed, rather than to professionals under their jurisdiction.*

Moore was more zealous than his opponent in expressing his views. He would later be gratified when the committee voted against proportional voting by five to four.

Moore reminded the committee that the National Council had been formed as an organization in which the State Boards could counsel together concerning discharging their duty to protect the public. "Implicit in the purpose is the establishment of mutual respect by the peer groups who incorporated the Council," he pointed out.

Moore went on to state that proportional voting would break the peer group precedent and must be based upon two premises:

1. The Member Boards of the National Council are knowledgeable in engineering registration requirements in proportion to the number of registrants under their jurisdiction.

2. The National Council is a professional society responsible to the professional engineers who were intended to be regulated by the Boards comprising the NCEE.

Moore also addressed the sentiment that proportional voting should be adopted to prevent larger states from "seceding" from the National Council, stating that acquiescing to such pressure would be a "concession to blackmail." It was pointed out that the strength of the Council lay in its diversity. It represented many different geographic, climatic, and population areas who had a say in the formation of national registration policy, and its policies should not be dominated by the numbers of professionals in highly populated areas.

Thus, while both sides had reasonable arguments concerning proportional voting, the National Council allowed the Constitution to remain unchanged on this issue. The Constitutional provision which was approved stated that each Member Board would be entitled to one vote.

Sliding Fee Schedule Adopted

The Council also adopted a sliding fee schedule with fees ranging from $150 for states with numbers of registrants ranging from 0 to 250 to $2,750 for states with numbers of registrants from 20,001 to 27,500. States with more than this would pay $2,750 plus 10 cents per registrant over 27,500. No Member Board was to pay more than $3,000.

(This fee schedule represented a hefty increase over the fee schedule in the 1970 Constitution; for instance at that time, the fee for the 0 to 250 category of registrants was $75, and the fee for the 20,001 to 30,000 was $1,200. However, the schedule was revised at the 1977 meeting so that Boards with fewer than 500 registrants would pay $150 and Boards with 500 or more registrants paid $1,250.)

Financial Controls Implemented

President Ted Stivers charged the Committee on Finances to develop a new system of accounting for controlling the financial affairs of the Council. Under the guidelines of Treasurer Waldemar Nelson, the Council began to implement the new Constitution and Bylaws provisions dealing with financial management. The Council's annual budget was to be prepared in a chart of accounts identifying all significant items of income and expenses so that conformance with or deviation from that budget might be readily checked. A system of accounting was to be set up using the same chart of accounts used in preparing the budget so that income and expenses could be verified simply. An annual audit was to be made by a CPA using the same chart of accounts. Moreover, financial reports were to be made at least quarterly by the staff to the Committee on Finances and the officers of the Council. All budget deviations were to be reported to the Board of Directors, all staff positions were to be authorized by the Board, and all expenditures other than payroll and taxes were to be authorized in writing. Staff members were to file time sheets, and all personal expenses were to be vouchered. (This includes travel, a major expense for the Council. For example, the next year the President reported that he had attended 33 meetings ranging from Portland to San Juan for a total of 84 days.)

Board Members Not Individually Liable

The Central Zone reported a significant court ruling in 1976. A lawsuit had been filed in Nebraska against the Nebraska Board and its individual members. While it appeared that there may not have been a strong defense against the lawsuit, nevertheless, the resulting decision was in favor of the Board and confirmed that Board Members are not individually liable while performing their duties as members of State Boards.

In 1977, a streamlined Council, on sound financial footing and with committees merged under the revised Constitution, seemed to have new enthusiasm. President T. E. Stivers' upbeat address reflected this.

National Trends Continue

The President mentioned several national trends and issues which he said had continued "with increased pressure," among them:

1. Mandatory continued professional development as a requirement for license renewal
2. Removal of exemptions from licensure for engineers employed by manufacturers of products for resale
3. Changes in state laws to provide for more public members (non-engineers, non-land surveyors)
4. Requirements for disclosure of personal assets and business affiliations of Board Members to permit evaluation and prevention of conflict of interest

In 1974, the Alaska legislature passed Conflict of Interest legislation that required elected and appointed government officials to make the following disclosures:

- Source of all income over $100 received by board member or a member of his household
- Name and address of each business in which he or a member of his household was a stockholder, owner, officer, director, proprietor, or employee
- Identity and nature of each interest in real property, including an option to buy, owned by him or a member of his household during the preceding 12 months
- Details of any loan or loan guarantee made to him or a member of his household
- Identity of any creditor to whom the member or a member of his household owed $500 or more
- A list of assets and liabilities for each board member and member of his household or family in excess of $500 (household goods and personal effects need not be identified)

The nine-member Alaska State Board of Registration for Architects, Engineers and Land Surveyors resigned, citing their inability to comply simultaneously with the provisions of this law and the Board's Code of Ethics with respect to the confidentiality required in client-professional practitioner relationships. In addition, the prohibition against board members representing clients before state regulatory agencies and commissions represented substantial economic discrimination against board members, and the board members were uniformly opposed to what they believed was unwarranted invasion of the privacy of individuals.

The provisions of the law were revised in 1975, and a new board was appointed.

The Uniform Procedures and Professional Guidelines Committee reported that legislative and judicial activities which seemed to be receiving the most public attention and which would have the greatest impact upon Member Boards includes (besides those which Stivers had mentioned) sunset laws, consolidation of Boards, and antitrust actions concerning competitive bidding.

The committee stated that, "No area of activity will have a greater impact on the present status of engineering registration than the enactment and implementation of sunset laws in the various states." The committee felt that it was highly desirable that the Member Boards have a set of guidelines to prepare themselves for the day when they would have to defend their activities and "plead for continued existence" and recommended that the Boards use the report on sunset legislation prepared by the NSPE.

On other issues, the committee reported that: (1) many proposals had been made concerning the consolidation of Boards, but none had been passed; (2) the enactment of bills providing for public members had proven quite popular, and an increasing number of states were reporting the appointment of public members; (3) there was activity in several states to remove the "no competitive bidding" clause in the Rules of Professional Conduct.

This latter activity was brought about by state attorneys generals' offices, with evidence that it was "being pressed on them by the U.S. Department of Justice." The committee pointed out that the suit brought against the Ohio Board was probably the most outstanding. (The Ohio Board was contesting the action in court.) Missouri solved the problem by electing a new attorney general after the former attorney general had advised the Board that he intended to file suit alleging that the code of ethics violated antitrust laws. The Colorado Architects' Board was required to remove the antibidding clause from its Rules of Conduct, and the Engineers' Board was required by the attorney general to remove the printed Code of Ethics from its annual roster. In Kentucky, some government agencies were apparently obtaining engineering services through competitive bidding procedures, but a proposal to lift bans on competitive bidding was defeated there.

(At the 1977 meeting, the Council abolished its Code of Conduct. The Mississippi Board quickly adopted a competitive bidding clause and sent copies of it to the Justice Department. At this writing, the issue has not been settled.)

The U.S. Department of Justice filed a suit against the Mississippi Board charging a conspiracy to obstruct justice in violation of the provisions of the Sherman Anti-Trust Act. Several years later (1983) the U.S. Department of Justice requested and received permission of the Mississippi Board to withdraw the suit. A federal judge issued an order withdrawing the suit. At this writing, the incumbent attorney general of Mississippi has received a request for an opinion as to whether or not the authorization in the statute to "restrict" competitive bidding enables the Board to adopt a rule to "prohibit" competitive bidding.

Industrial exemption was yet another area of legislative activity. Montana passed a bill which removed the industry exemption from a large part of industrial engineering activity. Several states reported legislative interest and some investigation, but in general, according to the committee, industry seemed "strongly opposed to any and all proposals being suggested." The committee felt that Texas had the strongest position. By judicial action, the only people in Texas entitled to be called engineers were those licensed by the State Board.

Iowa Enacts Mandatory Requirements

In further state action, Iowa became the first to enact mandatory requirements for continuing education for licensure. (At this time, State Boards and engineering societies were discussing the matter of continuing education *vis-à-vis* whether basic requirements should be established for continued practice; whether, if established, the requirements should be mandatory or voluntary; and, if established, how a uniform method of measuring continuing education could be established.)

Engineering Technology Addressed

The 1977 *Proceedings* contains two reports of historical significance. The first is the NCEE "Position Paper on Engineering Curricula Accreditation." In this paper, which was ratified by the Council with no dissent, it was recommended that *only degree engineering programs* be accredited under the name of the ECPD. The paper stated that:

> NCEE further recommends that accreditation of programs, other than degree engineering programs, be performed under the name of a separate agency, such as 'Scientific Technology Council for Professional Development.' This separate agency can be owned and administered by ECPD. By disassociating the words 'engineer' and 'engineering' from accreditation programs, other than degree engineering programs, the misunderstandings and confusion of the public, the legislators, and others will hopefully be minimized.

Thus the Council attempted to lay to rest the "engineering technology" dilemma that had plagued it for a number of years.

Another report of particular interest in the 1977 *Proceedings* is "The Registration of Professional Engineers and Land Surveyors in the United States." This is essentially a succinct history of the Council and its major issues such as reciprocity, the examination system, evaluation of qualifications, etc. It, along with the Public Information Committee report in 1978, are recommended as a fine "brief history" of the Council from its beginnings.

New Financial Procedures Effective

At the 1978 Annual Meeting in Louisville, Kentucky, it seemed that the light at the end of the tunnel was in sight concerning the Council's budget problems: President William J. Hanna reported that the Council enjoyed "an excellent financial position at this time."

Total assets had constantly increased, with the expectation that reserve funds would reach the goal of one year's operating expenditures within the next year or two. This was the first full year of Council operations under the new financial procedures, budgetary process, advance control of expenditures, and periodic control of finances required by the recent changes in the Bylaws, and Waldemar S. Nelson, the Council's first treasurer, felt that much experience had been gained on which to base future financial operations.

Exam Is Predominant Activity

Hanna reported that the production, distribution, and grading of examinations for both engineers and land surveyors continued to be the predominant activity of the Council. A substantial increase in total EIT exam usage in April 1978 by 80 percent, or 1,400; and in the number of engineering graduate examinees by 15 percent, or 2,100, were termed "notable increases." (With Pennsylvania adopting the exam in 1979, only three states continued as independent examiners.) A specific effort had been made to involve a larger segment of the engineering community in the preparation and review of exams. The Professional Examinations Advisory Committee was instituted by inviting the presidents of the discipline engineering societies to appoint an interested member to meet at the same time as the Uniform Examinations and Qualifications for Professional Engineers Committee in a liaison capacity. In addition, deans

of engineering programs throughout the country were invited to participate, especially in the area of the FE exam.

Validation of Land Surveying Examination

During the spring of 1978, the Land Surveying Committee under the guidance of Dr. Wiley Boyles began a process to ensure a valid land surveying examination. A task analysis questionnaire was prepared and edited, and a draft was mailed by Chairman Wainwright to some 800 land surveying licensees. The final questionnaire was prepared for evaluation in 1979 by the Council based on some 200 responses to the initial mailing. This effort introduced the Council to nationally accepted examination preparation procedures designed to ensure a valid examination process.

As a result of the Land Surveying Committee's work, the Uniform Examinations and Qualifications for Professional Engineers Committee recognized a need for a similar process within the engineering examination program. This was begun in 1979, completed in 1981, and the data used for the first time to validate the 1983 engineering examinations. During this same period (1979–1981), the Board of Directors authorized a review of grading and scoring procedures for the Fundamentals of Engineering and Land Surveying examinations. This resulted in a complete conversion of the grading and scoring procedures to the "Modified Angoff System." This system provided a method of grading that was not affected by the level of competency of the group being graded and, by use of a mini-exam within the exam, made it possible to link all exams for purposes of scaling and equating. At the 1981 Annual Meeting, President E. N. Bechamps reported the completion of this effort to be the single most important program of the year.

The Continuing Competency Issue

There had been growing pressure in the 1970s from the consumerism movement to force licensed professionals to show periodic proof of competency. Doctors, lawyers, teachers, accountants, and others offering professional services were being called upon by society to show proof of continuing education as a prerequisite for relicensure. Similarly, legislators across the country were being called upon to regulate the engineering profession more stringently in order to maintain high quality in products and services provided by the nation's engineers. Critics argued, according to an NCEE committee report, that in an age of rapidly expanding technology, "retention of the status quo is often tantamount to regression…" and the public could "no longer depend on the integrity and motivation of its engineers, or the stewardship of surveillance groups."

The first state law (Iowa's) mandating continuing professional development defined the concept as instruction which "…may be obtained through formal or informal education practices, self-study, research, and participation in professional, technical and occupational societies and by other similar means as authorized by the board."

The Council envisioned that three major suppliers of continuing professional development would be engineering societies, universities, and industrial in-house programs. All major technical societies currently had continuing professional development programs. Universities were well equipped to provide staff and classroom facilities, and employees usually paid for the courses. Many large firms in business and industry, which employed more than 70 percent of the engineers in the U.S., provided in-house continuing education programs for their engineers.

At the 1978 Annual Meeting, Dr. Benjamin Shimberg of Educational Testing Services presented a paper entitled "The Mandatory Continuing Education Bandwagon…Should Professional

Engineers Climb Aboard?" His basic conclusions were that CPC would not be a panacea, could prove costly and ineffective, and urged caution. In effect, he corroborated the tentative thinking of the Uniform Laws and Procedures Committee at their Chicago meeting in December 1973.

During 1978 the Board had requested then Past-President Stivers and President-Elect Amos Kent to develop a "Preliminary Position Paper on the Subject of Continuing Professional Competence." This was completed and approved by both the Board and the Continuing Professional Competence Committee and approved by the Council at the 1978 Annual Meeting. Distribution was authorized by the Council to all presidents of national engineering societies for review and comment. The "Position Paper" recommended that a survey be conducted to obtain factual information concerning voluntary CPC efforts and that a vigorous effort be launched to disseminate the information to the public, consumers, and state legislatures. The paper cited specifically those programs sponsored by the American Nurses Association offering Continuing Education Units (CEUs) as an example which societies might follow. It was further recommended that ECPD was the logical entity to develop such a CEU program.

The paper discussed a number of reasons for its stand against mandatory CPC. It pointed out that such a program would not be cost effective and that no significant numbers of incompetent practitioners would be eliminated by mandatory CPC. The paper contended that "the great majority of professionals must continually develop their competence to survive in the marketplace" and that most engineers continue to assure their own competence "on a large and highly successful scale under the present voluntary system." It further stated that "virtually every practicing engineer" was engaged in some form of professional upgrading. (There was no hard data to back this conviction—hence the recommendation of a survey.)

Another reason cited against mandatory CPC was the diversity of the engineering profession. This diversity was seen in prohibiting the effective management of a mandatory CPC program. (At the time of the paper there were more than 100 degree programs offered by U.S. colleges and universities.) When the specialties were further divided, thousands of subspecialties resulted, making the engineering profession far more fragmented than medicine, law, etc.

Another issue involved in mandatory CPC was that it would discriminate against the licensed engineer. Because of the exemption clauses in state statutes, only about 30 percent of the approximately 1 million engineers in the U.S. were registered. It would be patently unfair to apply further strictures to those engineers who had already taken the trouble to become licensed. The paper further pointed out that these same statutes give State Boards extensive disciplinary powers, and that when incompetence is suspected, any citizen has the right to redress wrongs through State Boards as well as the courts.

Board Assumes More Duties

In the seventies, the Council's Board of Directors had become more active, and by 1979, the *Proceedings* for that year listed eight meetings during the 1978–79 working year (one meeting being a conference telephone call), with a total of 174 actions being recorded. The Board had begun handling matters which formerly had been handled by the full Council; this was perhaps a more effective way of dealing with certain matters since the Board meets more often and hence has a more comprehensive understanding of particular issues. For instance, the Board established a procedure for determining and combining raw scores on the Fundamentals of Engineering Exam, beginning with the fall 1980 exam. This was an issue which had been

debated for years. Certainly the Board's actions freed the Council to act on issues appropriate to the full body.

ABET Inaugurated

Besides a landmark decision to authorize construction of a building in the Clemson area, the Board endorsed a name change which signaled a new era: the name Engineers' Council for Professional Development (ECPD), which in a reorganization had become associated with the American Association of Engineering Societies, was changed to the Accreditation Board for Engineering and Technology (ABET). The accreditation functions of ABET, which began January 1, 1980, were to be carried on by the Engineering Accreditation Commission (EAC) and the Technology Accreditation Commission (TAC). The ECPD had been founded in 1934; thus, the beginning of ABET was the end of a tradition more than four and one-half decades old.

Simultaneously, the Council itself in 1979 was ending its sixth decade, and the relative importance of the work of the Council continued to shift. Some issues diminished as others emerged as major items.

However, the uniform examinations program continued as the Council's major activity. April of 1979 witnessed the largest number of states using the largest number of exams in every category, with a major growth in the program occurring when Pennsylvania joined. Discussions began with the Board of New Jersey (which had not yet used the exam); the Montana Board administered exams to Canadian residents in Alberta, and EIT exams were administered at West Point and Annapolis. The Air Force Academy made inquiries about the feasibility of some states besides Colorado administering the exam since Colorado was one of the last three states still not using the national exam.

A validation study based on a job activities questionnaire was under way and was expected to result in a modification and validation of the NCEE Land Surveyor Exam. The subject of guaranteeing that professional examinations be relevant to the practice of the professions and not discriminate against any class of examinees was appearing in proposed state and federal legislation.

Competitive Bidding Issue Subsides

The issue of competitive bidding had subsided, although the previously rescinded Rules of Professional Conduct had been revised and adopted by the Council as guidelines, with the Professionalism and Ethics Special Ad Hoc committee recommending that the Council continue to work with the major engineering societies to form a common code. The controversy over the industrial exemption clause had cooled to the point of calm discussions between major industry and several segments of the engineering profession. Sunset legislation was gaining momentum.

The Executive Director reported that the NCEE, at the end of the seventies, was "in the midst of dynamic changes in the engineering profession" and that the Council would need to address several major issues in the next few years. These included (besides the issue of continuing competency already discussed) validation studies of the examination, the grading process, and turnaround time.

The Seventh Decade Begins

The National Council began its seventh decade with vigor: a new site for its headquarters was decided upon, a task analysis was undertaken to provide validation for the national exam,

a technique was chosen to provide better cutoff scores, and a Long Range Planning Committee presented the Council with thoughtful goals for the coming decade.

These and other developments such as strengthened rapport with other organizations, a new policy manual, the approval of new disciplines on the exam, and a reevaluation of the national Records Program all testified to the Council's flexibility and viability. (The professions in the United States were the subject of criticism from various sources during this period. Some opponents, for instance, viewed the professions, i.e., those occupations which required registration, as self-serving monopolies seeking to keep out competition rather than as organizations which sought primarily to protect the public health, safety, and welfare through the registration process. Exam validation by the professions was a key element in the process of excluding incompetents from practicing, i.e., making sure the exam actually measured some minimum standard of competency. Probably all State Boards in all professions were eager to show measurable usefulness, for the South Dakota Board had already been dissolved by the governor, probably under sunset legislation.)

No doubt the most significant of these was the exam validation movement. This had evolved among other professions from a number of factors such as high failure rates, public complaints to authorities, noncompliance with guidelines of the Equal Employment Opportunity Commission and testing standards of the American Psychological Association. In addition, the Federal Trade Commission was studying the exams because they crossed state lines.

At the 1980 Annual Meeting a panel discussion lead by Paul R. Munger examined the need for and updated the progress of the ongoing engineering task analysis. Cass Hurc, Wiley Boyles, William Carew, Ernest Gardow, and William Gorth presented papers on validation and the part the task analysis played in the process.

The essence of the validation issue was whether or not the exams were a valid instrument in determining minimum competency to practice the profession in question as it related to public health, safety, and welfare. The Council's first answer to the dilemma was to perform a job task analysis of the land surveying profession to determine what knowledge and activities were *actually used* in the performance of individuals practicing that profession. The National LS exam was subsequently rewritten to reflect the profession of land surveying as it was actually practiced. The Council then moved on to a similar task analysis of the engineering profession to assure validity of the PE exam.

Related to the issue of exam validation was the question of how to determine cutoff scores, a problem which had been simmering ever since the national exam had been widely adopted. In 1980 the Council's Board of Directors adopted the "Modified Angoff" procedure for establishing the recommended minimum passing standard for the new format of the FE exam. A special committee for establishing minimum passing standards was formed, and under the guidance of the Educational Testing Service the committee was to determine the cutoff score based on the established procedure recognized in the measurement field. This procedure had been accepted by the American Psychological Association and upheld by the U.S. Supreme Court as defensible and fair.

The Board of Directors authorized the preparation of seven discipline examinations for the use of the California Board only. These were: control systems, corrosion, fire protection, quality, safety, traffic, and metallurgical engineering. California requested these exams because of their recently legislated registration act which designated many small disciplines as areas of registration for engineers. This was not a practice act; however, the practice act remained applicable only to the traditional disciplines. In subsequent years, there were several attempts made to repeal this registration act, but as of this writing it still exists.

Records Program Continues

The Records Program Committee had been charged with conducting a thorough examination of the NCEE Records Program to determine the value of the program to the Council, the State Boards, and the registrants and to determine the economic feasibility of the program. The committee recommended that "the Records Program be continued as a beneficial program for both Member Boards and registered professional engineers…." and found that for the past three years "there has been a substantial income over cost of this program." Thus a tradition would continue which had had a small but steady number of users since the early years of the Council. Subsequently, in 1984, President Sam Wainwright initialed an expansion of this program to include Engineer-Interns.

New Policy Manual

The NCEE staff, under the direction of the President, Alfred Samborn, reviewed past issues of NCEE *Proceedings* of Annual Meetings, Boards of Director's minutes, committee reports, etc., to collect all actions which might be classified as "policy" statements and to record them in an NCEE policy manual. The manual was divided into four categories: administrative, financial, examination, and professional policies. This manual, which was adopted at the 1980 Annual Meeting, fulfilled a need which the Council had been experiencing for several years. For the first time, the information required by new Board Members was assembled in one volume to assist them in understanding the role which the Council plays in registration activities.

Council Headquarters Location

During the 1976–77 Council year, pressure began to develop to relocate the Council headquarters to another location, such as Washington, New York, Atlanta, or elsewhere. Various reasons were cited, but review by the President and Board disclosed no adequate justification. At the same time, it was recognized that as the Council programs developed, it would be desirable to have more adequate quarters and perhaps a wise investment to construct our own building. In 1977, the President appointed an ad hoc committee, and their general recommendation was to continue in the Seneca/Clemson area.

Subsequently, in 1977–78, the Long Range Planning Committee was assigned to review the matter and develop recommendations. The 1978 *Proceedings* records their recommendation that a new task committee be formed and charged with the study and procurement of new headquarters space in the Seneca/Clemson area, determining whether rental or ownership was most feasible. This was hotly debated, and final action was to create a nine-member Site Location Committee, which was appointed by President Hanna, chaired by Past-President Moench, and directed to report at the December Board Meeting.

The Board of Directors received the report of the Site Location Committee at its December 1978 meeting. This report recommended that provisions be made for the headquarters to remain in the Clemson area for approximately five years. President Frederick Rogers appointed a committee to investigate rental/lease purchase possibilities in the Clemson area. The Committee was chaired by President-Elect Al Samborn with Vice Presidents E. N. Bechamps, Albert Kersich, and Leigh Morrow as members. After an unsuccessful attempt to bid on a building in Anderson, SC, the committee searched for another building. When it was impossible to find one suitable, a search began for building sites. E. N. Bechamps and Associate Executive Director Roger Stricklin

investigated twenty-six sites and selected twelve which might be of interest to the Council. These were narrowed to three, then one. An offer was made, but it was not accepted, and the owner removed the property from the market. During this process Bechamps had also met with a vice-president of Clemson University who advised him that Clemson was not interested in having the Council on campus. In July of 1979 three more sites were identified, but by the time of the 1979 Annual Meeting no acceptable site had been found.

The Building Committee now consisted of Albert Kersich, Chairman, President-Elect E. N. Bechamps, Vice President Sam Wainwright, and Treasurer O. W. Summers.

After the 1979 Annual Meeting, a new president was appointed at Clemson University. This event abruptly changed the course of the Council's search for a headquarters location. The new president of Clemson University was Bill L. Atchley, P.E. a former Board Member of the West Virginia Board. Paul Munger, the Vice President from the Central Zone, had known Bill Atchley for many years, and he volunteered to contact him on behalf of the Council. A short time later the same Clemson vice-president presented Bechamps with six on-campus sites to consider as the NCEE headquarters site. By December of 1979, the present site was selected, and negotiations began on a lease with Clemson University. By the 1980 Annual Meeting the Board had approved the lease, hired an architect, and prepared a building budget of $550,000 for Council approval.

During the 1980–81 year, plans were completed, bids were received, construction started and was completed *within budget*. The staff occupied the new headquarters in September of 1981. In December of 1981, a formal dedication was held, and, of course, the principal speaker was Clemson President Bill Atchley. As of this writing, the same building continues to serve the Council adequately.

Task Analysis of Licensed Engineers

President E. N. Bechamps reported at the 1981 Annual Meeting that a most important accomplishment of the Council was the completion of the Task Analysis of Licensed Engineers. The data resulting were subsequently studied as a basis for new specifications for the Professional Engineering Examination format and scoring procedure, with April 1983 as a target date for new exams in civil, chemical, mechanical, and electrical engineering.

The evaluation firm sent 5,000 pretested questionnaires to licensed engineers in the U.S. who had been selected randomly. All states and all 15 disciplines on the PE exam were represented. An unusually high return rate (80 percent) meant that there were a sufficient number of respondents to make a completely adequate analysis of the overall profession. The survey was comprised of 257 tasks organized into eight major clusters including development, design, construction, manufacturing and operations, maintenance, administrative management, education and training, and other categories which were combined, such as systems analysis, marketing, sales, and consulting. The engineers in the sample were asked to provide information on the job-relatedness and the appropriateness of each of the tasks as an entry-level requirement for an engineer. One of NCEE's testing consultants concluded, "We have a veritable gold mine of data that can be used for quite some period of time in documenting the fact that NCEE examinations are good examinations, that they are valid and fair examinations." Dr. Wiley R. Boyles, who envisioned testing through interactive consoles within 10 years, further stated that engineering was "the profession on the cutting-edge of good professional examining." One anticipated goal was to formulate an examination that would cover the requirements for all engineers to practice by finding the commonalities across all disciplines.

How Successful Is the Council?

The stated purpose of the Council is to provide an organization which will allow the State Boards to discharge their responsibilities in regulating the practice of engineering and land surveying "as it relates to the welfare of the public in safeguarding life, health, and property." Thus the success of the Council can be judged on how well it has fulfilled that purpose.

Certainly the task analysis and the resulting exam establishing minimum competency plays a fundamental role in the Council's success today. Given that the registration process is a true winnowing process rather than a self-serving monopoly as some professions have been called (one must remember that engineers, too, have to drive across bridges!), then the Council, through its monumental task analysis and subsequent exam, must be commended by anyone who has studied its activities. It appears that the Council has done all that an organization can do to compose a valid exam and has worked diligently to arrive at a sound method of determining a recommended cutoff score. At this writing, all 50 states and 5 territories use the Council's national exam, which is formulated at workshops attended by exam writers from all over the country.

The Model Law which has evolved over the years is used in most states as a *model* to guide legislatures writing laws concerning fundamental requirements for registration such as experience, education, and examination. And while all state laws differ, standards have been established upon which the principle of comity among states can be negotiated. While there are still difficulties relating to the practice of comity, the extent to which universal comity has become a reality is remarkable when one remembers how diverse the states are, each with its own individual needs and each very protective of its authority. (And they are justified in being so—their right to regulate the profession is guaranteed by the Constitution.) This Model Law is constantly reviewed and is revised regularly.

Growing Percentage of Registrants

At this writing, approximately one-third of the engineers employed in this country are registered, and the Council has become very aware of the role of public relations in informing the engineering community of the importance of registration. The percentage of engineers who choose registration has grown steadily.

Professional Ethics Undergirded

At the 1983 meeting, the NCEE Board submitted a recommendation to ABET that "…the criteria for accrediting programs in engineering and land surveying be amended to include formal courses on ethics in the profession…." Moreover, the Council has always been and no doubt will continue to be, very vigilant in its awareness of issues of professional conduct.

In short, it appears that the engineering profession, and the citizenry, owe the Council a debt of gratitude. Many fine persons have worked tirelessly through six and a half decades to develop a profession which is one of the most important infrastructures in our society. It is the profession which affects the quality of our communications, transportation, medical care, food supply, defense system, and almost all other aspects of our lives.

The Council has proven that it is a worthy guardian of the public health, safety, and welfare.

"Visions of 1990"

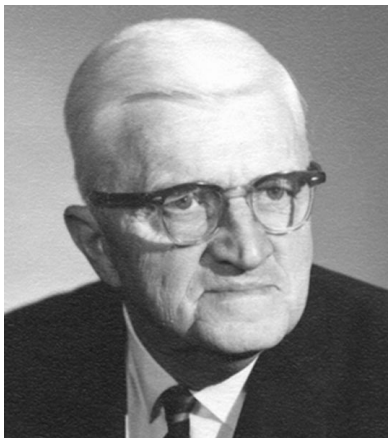
At the beginning of the decade, the Long Range Planning Committee reported a list of developments—"Visions of 1990"—which ideally might result in the years to come. The committee

had been charged with forecasting the types of problems which the Council might encounter and to recommend priority areas of study. Along with those recommendations, the committee prophesied "a few timely acts of statesmanship" that the Council should aim toward, among them:

- A much wider representation in State Board membership from all branches of the profession
- A closer alliance among NCEE, ABET, and ASEE
- Automatic NCEE representation on every engineering accreditation visit
- An ASEE policy that all faculty members in engineering design be licensed
- An upgraded, validated FE exam administered as a comprehensive exam for all students receiving a first degree in engineering
- Recognition by all State Boards of the licensing requirement of graduation from an ABET-accredited program in engineering or an equivalent thereof
- No regulated vocational or professional activities in which lifetime licensure is granted, and much more stringent requirements for professional competency
- A Records Program recognized as the central depository of official documentary and personal biodata of all types of engineers
- The exemption controversy a moot issue by virtue of universal recognition by engineers of the value of licensure

The Council has always had an internal self-righting system. It constantly seeks information, additional data, expert opinion, etc. and has shown itself to be willing to adjust its methods and its goals (the Council is, after all, a system which is subject to cybernetic dynamics). If these are the most worthwhile goals of the Council, they will be achieved—if not in 1990, then in due time. If the above goals demand rethinking, the Council can be trusted to right itself and evolve new purposes to serve the profession and society.

L. E. McCartt
Kentucky
1959–1960

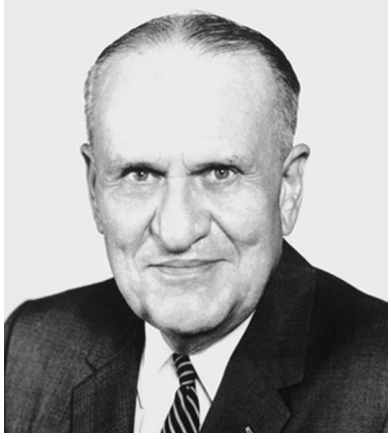


O. B. Curtis, Sr.
Mississippi
1960–1961

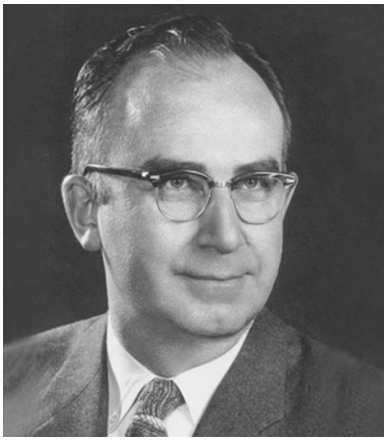
A. L. Henny
Oregon
1961–1962

Weston S. Evans
Maine
1962–1963

William M. Spann
Missouri
1963–1964



John Ward Beretta
Texas
1964–1965



Leo W. Ruth, Jr.
California
1965–1966

Donald E. Marlowe
District of Columbia
1966–1967

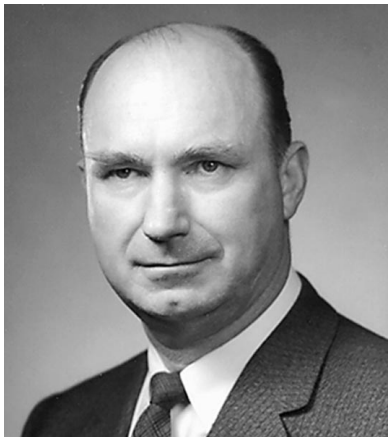
Edwin R. Whitehead
Illinois
1967–1968

George F. Branigan
Arkansas
1968–1969

W. Morgan Allen
Oregon
1969–1970

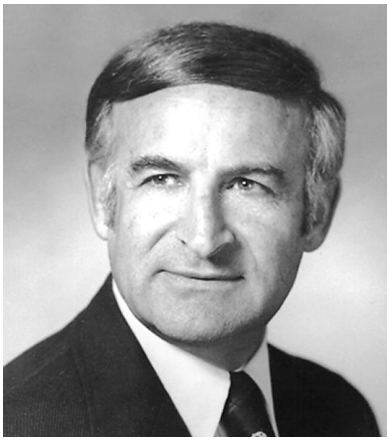
Chester A. Arents
West Virginia
1970–1971

Anthony L. Bavone
North Dakota
1971–1972



Roy T. Sessums
Louisiana
1972–1973

Orland C. Mayer
Idaho
1973–1974



Morton S. Fine
Connecticut
1974–1975

Herman A. Moench
Indiana
1975–1976

T. E. Stivers
Georgia
1976–1977

William J. Hanna
Colorado
1977–1978

Frederick H. Rogers, Sr.
Maryland
1978–1979

Alfred H. Samborn
Ohio
1979–1980

Eugene N. Bechamps
Florida
1980–1981

Albert T. Kersich
Montana
1981–1982

Wm. E. Carew, Jr.
Delaware
1982–1983

CHAPTER 5
Looking Toward the 21st Century
1984–1995

As the National Council of Examiners for Engineering and Surveying (NCEES) celebrates its 75th Anniversary and turns toward the 21st century, it is appropriate to look at three subjects which have emerged as central to the Council's activity and influence: *professional ethics*, which is critical because of the enormous ramifications of engineering; *the examinations*, which the Council, over a period of decades, has developed into economically feasible and legally defensible tools for measuring minimum competency; and the *internationalization of engineering*, in which the Council is destined to be a world leader—perhaps "the" world leader.

Professionalism and Ethics Come of Age

During the decade prior to the 75th Anniversary of the Council, the evolution of its position on professional responsibility and ethics was perhaps its greatest achievement. At the 63rd Annual Meeting in 1984, Dr. Edward O. Pfrang, executive director of the ASCE, sounded the tocsin in his address to the Council. After describing his role in the investigation of the 1981 collapse of the walkway bridge at the Hyatt in Kansas City, Missouri, Pfrang urged the Council to address the issue saying, "I submit that you are the last hope in regard to professional responsibility. Engineering examiners represent the public; they have been appointed to protect the health and safety of the public…[If a major disaster occurs] we as engineers will lose total control of our destiny, because legislation will be passed so quickly that we will no longer be in control of the practice of engineering…."

Discussion centered on the faulty construction of the bridge, which collapsed because of a rod connection failure. Pfrang said that no one involved in the construction project was willing to accept responsibility for the failure, which he called a disaster waiting to happen.

"Dangerous Trends"

The speaker was former chief of the structures division of the Center for Building Technology, National Engineering Lab, National Bureau of Standards, and had been involved in the investigation of the collapse. In connection with the mishap, he discussed what he called some "very unfortunate and dangerous trends in the practice of engineering," saying that in civil and structural engineering, professional responsibilities were not being "picked up anymore." Pfrang felt that everyone involved was pointing a finger at someone else and maintaining, "It wasn't my fault; it's the other guy's fault."

He compared this attitude with 50 to 100 years ago, when professionals took pride in their work and accepted a full range of responsibilities. Drawings were masterpieces of detail, prepared by a master builder who had charge of relatively unskilled labor. However, Pfrang was concerned about

another kind of "masterpiece:" approval stamps which were artfully worded to say "…I accept no responsibility for it; it just came through here, and I logged it in." He explained that, "We have insurance companies and legal staffs telling us not to accept responsibility," and that one way to reduce fees was to reduce the amount of responsibility accepted.

At that same meeting, President Paul Munger stated that it was the position of many boards that engineers are responsible for anything they put their seal on and that they should not practice engineering outside their professional competency. Munger felt board members had a responsibility to advise their state legislators on legislation needed to make sure the profession worked appropriately. He also emphasized the need for good enforcement programs. Munger expressed the hope that something positive might come from the Hyatt incident: i.e., regulation and new laws "that would clearly define whose responsibility was what and leave no gray areas so you can have other failures such as this one."

President Sam Wainwright later expressed similar concerns, stating that even though continuing improvement of examinations was the Council's first priority, rules of professional conduct and their enforcement were of equal importance to licensure.

Model Rules of Professional Conduct Revised

Professionalism and ethics might be said to be the core issue of the Council, since its *raison d'etre*, according the Constitution, is the "practice of engineering and land surveying as it relates to the welfare of the public in safeguarding life, health, and property." An ad hoc Committee on Professionalism and Ethics was organized in the early eighties to address the issue. As a later committee report stated: "Professionalism and ethics has come of age as a major consideration in the practice of engineering and land surveying."

Rules of professional conduct for engineers had been adopted in 1974, but in 1977 the Council passed a motion to rescind them on the grounds that such rules were the function of the various states. Debate continued about the development of rules and the role of the Council, and it was felt that constituent boards would request direction in this area. By the 1984 Annual Meeting, the ad hoc Committee on Professionalism and Ethics was once again reviewing the *Model Rules of Professional Conduct*.

This committee also worked to provide information for engineering schools to use in creating courses in professionalism and ethics; prepare information that could be used by Board members in communication with the public; include questions on professionalism and ethics on the examinations; compare state rules with the Council's *Model Rules of Professional Conduct*; and study past engineering failures for possible patterns in disregarding rules of professional practice.

The committee proposed revised *Model Rules of Professional Conduct*, and the Council adopted these in 1985. The revised rules addressed two areas of primary concern: the seal and whistle-blowing. They stated that licensees' first and foremost obligation is to the public welfare; that licensees shall approve and seal only "those design documents and surveys that conform to accepted…standards and safeguard the life, health, property, and welfare of the public; that registrants shall notify their employer or client and such other authority as may be appropriate when their professional judgment is overruled under circumstances where the life, health, property, or welfare of the public is endangered; and that registrants having knowledge of possible violations should provide the Member Board information and assistance." Other rules related to the licensees' obligation to employers, clients, and other licensees.

The rules forbade licensees from affixing their seals to any documents dealing with subject matter outside their area of competency, nor documents not prepared under their direct control and personal supervision.

(The *Model Law* said, "The seal and signature should be used by licensees only when the work being stamped was under the licensee's complete direction and control." Jurisdictional statutes are not necessarily the same as the *Model Law*, and most are not.)

In 1985, President Sam Wainwright stated that, "Model statutory rules of professional conduct, along with strict enforcement procedures, need to be emphasized by the Council so that the professional commitment aspect of the registration process receives as much emphasis as the qualifications requirements." He called for the commitment of additional resources to aid Member Boards by addressing every facet of the licensure process. Wainwright indicated that rules of professional conduct and their enforcement are of equal importance to licensees. It was his personal belief that "consideration should be given to the development of a uniform code of professional conduct which all states could use…."

Thus, the Council's official role in promoting codes of conduct had been revised from the 1977 decision to rescind its rules and leave such concerns to the states. The Council was taking to heart Pfrang's urging. In 1986, the ad hoc Committee on Professionalism and Ethics was voted a standing committee, with Sammie Lee recommending the move because of the committee's "importance to the future of the profession." Its charge to the next year's committee was to encourage adoption by each state of the Council's *Model Rules of Professional Conduct*.

Another important step of the 1985–1986 committee was to recommend that a professionalism and ethics item, a case-study practice situation, be included on the Principles and Practice (PE) examination.

"Challenge from the Public"

In 1987, President J. Harry Parker referred to "the increasingly more vocal challenge from the public for protection of life, health, and safety in the practice of engineering and surveying."

The new standing committee held its first meeting in 1987, having been directed to deal with university teaching data, among other things. The committee canvassed universities and colleges to collect, review, and update coursework data. The committee also studied the feasibility of presenting certificates with a suggested ceremony program to be made available to states. A possibility considered was a ceremony performed by board members at area professional society meetings. The committee also was asked to assist with a seminar on professionalism and ethics at the next Annual Meeting.

In 1990, the committee presented a syllabus for a correspondence course on professionalism and ethics. The committee recommended that Member Boards be encouraged to use the course, which covered a variety of topics including ethical theory, professional responsibilities, safety obligations, moral reasoning and dilemma, conflict of interest, whistle-blowing, environmental and computer ethics, weapons development, and obligations to the profession.

To complement the concept of a correspondence course, the committee also proposed a questionnaire for professional engineers seeking licensure by examination or comity. The committee felt that including questions on the examination itself was not feasible because it would complicate the examination in regard to the precise answers required. The proposed questionnaire was based on principles in registration laws and rules of professional responsibility.

Course in Effect

By 1991, the correspondence course was being taken by at least 40 persons in eight states, and more than half the Member Boards had used it for disciplinary purposes. This course, which had been developed jointly by the Council, the Texas Board, and others, was monitored by the Murdough Center at Texas Technical University. The Council recognized the course as a Council-approved correspondence course to be used by Member Boards as they saw fit. Efforts began in 1994 to develop a similar correspondence course for land surveying.

Earlier the committee had been charged with developing a resource book of organizations and individuals involved in ethics training. However, it was learned that the National Institute on Engineering Ethics had already developed such material, and the committee recommended that this manual be distributed to Member Boards.

In 1992, the committee recommended against the Council's approving that Member Boards require continuing professional education. Instead, it believed that continuing professional education should be encouraged on a voluntary basis and uniform guidelines be developed for use by Member Boards.

The committee also discussed the need for a "professional degree" equivalent to those required as a prerequisite in other professions. The committee recommended that the Council work with other professional organizations to accomplish this goal.

A strategic long-range plan (5 to 10 years) for the Council's Committee on Professionalism and Ethics was formulated. This plan pinpointed issues, proposed strategies and actions, and suggested timelines. The purpose was to allow future committees to develop annual charges, while reviewing, evaluating, and updating on an annual basis.

The 1991–1992 committee polled Member Boards and found that 26 submitted to their applicants information or questionnaires on laws and ethics. The committee prepared a take-home, pre-application questionnaire, and the Council voted to revise the *Model Law* to allow the administration of such a questionnaire. It was felt that administering the questionnaire would cause the applicant to read the registration laws and the *Model Rules of Professional Conduct*.

Long-Range Plan Refined

The 1994 committee report refined the long-range plan to include the following issues: interprofessional communication; reinforcement of the responsibility of professionals in self-policing; the definition of professionalism; the need for professionals to play an active role in public policy; integration of licensure more closely with the educational process; and the need to eliminate industrial exemptions.

The committee added that a *foremost priority* of the Council should be keeping practitioners alert to elevating the standards of the profession for the benefit of the public in protecting health, safety, and welfare and charged its successor with developing a Mission Statement to reflect that priority.

The 1995 Board of Directors went a step further, proposing a new NCEES Strategic Plan, which included Vision and Mission Statements that emphasized, among other issues, the importance of both professional ethics and continuing professional education. Adopted by the Council at the 1995 Annual Meeting, the new Strategic Plan stated that "The Vision of the NCEES is to provide leadership in professional licensure of engineers and land surveyors through excellence in uniform laws, licensing standards, and professional ethics for the protection of the public health, safety, and welfare, and to shape the future of professional licensure."

The new Mission Statement specifically emphasized professional ethics and continuing professional education saying:

> The Mission of the NCEES is to (1) assist Member Boards in the promotion and promulgation of regulatory processes for engineering and land surveying which demonstrate high standards of knowledge, competence, professional development, and ethics; (2) provide services to Member Boards that promote uniform licensing procedures which emphasize quality education, examination, experience, and continuing professional competency; and (3) coordinate and cooperate among domestic and international organizations to promote licensure of all engineers and land surveyors.

The Council in 1995 also approved a recommendation that ABET general criteria for accreditation include coursework on ethics in engineering and professional issues in both curricula and student experience requirements. In an effort to ensure consistently rigorous standards for all licensed land surveyors, the Council in 1995 also voted to change the *Model Law* to require that surveyors receive EAC/ABET or RAC/ABET accredited education before they are allowed to sit for examinations.

The Committee on Professionalism and Ethics revised the *Model Rules of Professional Conduct*, a course in Professionalism and Ethics, a take-home questionnaire, and development of a new Strategic Plan with a Mission and Vision Statement. The Council had once again proved, as it had so many times before, that it was worthy of its mandate to promote the public welfare.

The ramifications of engineering technologies for the public welfare today are all-pervasive (e.g., nuclear power plants, bridge and highway systems, public water works, weaponry, and pharmaceutical research, to name just a few). It is conceivable that any one mishap might cost thousands, even millions of lives. It might be said that in the period 1984 to 1995, the Council made a quantum leap in its promotion of the public welfare through the activities represented by the Committee on Professionalism and Ethics.

The Council has shown itself to be a trustworthy and effective leader in the past. It will no doubt continue that leadership in the future in whatever way the public welfare requires. Its role is of the utmost importance as the Council becomes increasingly involved in international aspects of the profession.

The Examinations Continue to Evolve

Another major development during the 1984 to 1995 decade was the continuing evolution of the examinations that form the basis of licensure. The number of work hours and the care that go into writing and grading the examinations is virtually mind-boggling. Over the years, these efforts have consumed most of the Council's time and have been a major source of Council income. The primary purpose of the examinations is to determine minimum competency. Several achievements in the last decade are critical to this purpose.

In 1984, a new contractor administered the FE examination, a move that cut costs by one-third. Partial automation was achieved at this time by using machine-scorable biodata sheets to collect information about the examinations and the examinees, e.g., an item analysis with which to document the validity of the examination.

Security policies such as changes in office operations to include identification badges, visitor entry, and access control also were implemented, and others were being developed for future implementation.

Examinations Are "Psychometrically Sound"

Beginning with the 1983 examinations, all PE examinations were considered to be on a "psychometrically sound" basis—that is, they could withstand challenges by courts and regulatory agencies as to whether or not they validly measured what they claimed to measure. Dr. Wiley R. Boyles, the Council's psychometrician, was quoted in a 1984 committee report as stating that the engineering profession was one of the leaders in the professions in the United States in applying job-related or task analysis research to verify the validity of licensing examinations. The Council examinations are based on knowledge required in tasks conducted by significant numbers of licensed engineers in each discipline, with emphasis on subject areas in which licensed engineers are most active.

The method of determining the minimum passing score for the PE examination also was changed in this time period. (Rationales for determining cutoff scores of examinations for various professions had come under scrutiny by the courts.) The Council moved from a norm-referenced method to a criterion-referenced method in which a group of licensed engineers familiar with what practicing engineers *themselves* say they are required to know (as summarized in the NCEE *Task Analysis of Licensed Engineers*) established a minimum passing score on each test item.

At that time, the cost of grading the examination was $150,000 per year, and the cost of putting the examination together was about one-third that. The Council was concerned that these disproportionate costs left too few resources going toward the examination preparation and content. Machine grading was being considered, for as President Wainwright said, "Continuous improvement of our examinations is our first priority."

At the 1985 Annual Meeting, Boyles, in discussing measurement standards for testing professional licensure qualification, quoted testing authorities as stating, "Defining the level of competence required for licensing or certification is one of the most important *and difficult* tasks facing those responsible for such programs." Boyles went on to suggest automated scoring as a way to improve the three-month turnaround time of scoring while maintaining the accuracy of student performance assessment.

Machine Scoring Discussed

Boyles pointed out that the responsibilities facing the Council besides validity (the measurement of competency rather than other factors not related to public welfare) were making sure that passing decisions were based on knowledge demonstrated rather than on which scorer was scoring and that scoring be completed as soon as possible. Machine scoring was being looked at, and a presentation was made on several types of machine-scorable questions.

At this meeting, delegate Donald F. Cairns of Missouri pinpointed a specific misgiving concerning machine-scored examinations: could they show not only that the examinee knew the right numerical answer, but also that he or she had demonstrated mastery of the process by which the answer is to be found? Cairns also expressed another shortcoming of machine-graded tests of competency: they cannot reflect the fact that in the real world, engineers have time to check their calculations and have them verified by colleagues. (This shortcoming is a handicap, for instance, for persons who do not respond well under test conditions.)

At the meeting, psychometricians discussed two new types of machine-scorable questions: branching and mark-sense. Besides reducing costs, machine scoring also assured equal scoring of all examinees, thereby giving the test legal security in that examinees are less likely to challenge the test on the basis of uneven or unfair scoring. This method also contributed to testing reliability, or consistency of measurement for each person. Branching, a relatively new format at the time, was designed to test professional judgment and problem solving.

This discussion was based on a feasibility study only, and more research was required to determine if machine-scorable tests could mirror results obtained from traditional formats; i.e., accurate measurement of minimum competency.

By 1986, a plan was formulated to offer a test which would consist of 25 percent objectively scored items. This test, to be offered in 1988, was for a Principles and Practice (PE) examination in Chemical, Civil/Sanitary/Structural, Electrical, and Mechanical Engineering (Group I). About 35 individuals were involved in writing a prototype examination to be administered in May 1987. An effort was made to recruit as many new item writers as possible who were not educators to represent the "experience factor." (Critics had claimed previously that the PE examinations were "too academic.")

The Examination Review Subcommittee reported that different machine-scorable formats were explored based on consultants' advice and Council experience. The items rewritten in new formats had been given on recent traditional examinations, with all examinations since 1984 researched.

In January 1987, a pretest given to college seniors presented all questions in three new formats: latent imaging, mark-sense, and a form of multiple choice. The committee was disappointed in the insufficient number of "motivated volunteers" to take the examination. However, valuable information was derived from the pretest comments and examination materials, and a prototype examination was designed.

Unfortunately, the small number of examinees made statistical analysis impossible, and left the committee hesitant to pursue future prototype testing. Nevertheless, during the pretesting and prototype test, two of the three machine-scorable formats (latent image and mark-sense) had been eliminated as possibilities at that time for the engineering examinations. The committee recommended a combined format of traditional free-response items and objectively scored multiple-choice items.

Consultants, the Examination Review Committee, subject matter experts, and NCEE Board members had all concluded that engineering knowledge, skills, and abilities can be evaluated by objectively scored examination problems, thus reducing the scoring costs, a primary concern.

Objectively Scored Items Included

The inclusion of three objectively scored examination items in the AM and PM sections of the PE examination began in April 1988, culminating work begun in 1985.

That year, the list of (proposed) disciplines on the examination indicated how far the engineering profession had developed during the 75 years of the Council's history: Chemical, Civil/Sanitary/Structural, Electrical, Mechanical, Manufacturing, Ceramic, Industrial, Petroleum, Agricultural, Nuclear, Aeronautics/Aerospace, Mining/Mineral, Fire Protection, Supplemental Special Structural I and II, and Metallurgical.

In 1989, a nationwide uniform examination schedule was proposed to eliminate or curtail security problems such as candidates' sitting for the same examination in adjacent jurisdictions

during the same examination cycle. Executive Director Roger B. Stricklin, Jr. recommended such a schedule be observed by all jurisdictions, who would be given three to four years' notice. Such a policy was adopted in 1990 and implemented in October 1993.

At the 1989 meeting, the Council also discussed whether to eliminate the combined examination, that is, one in which the candidate is permitted to work eight problems from any discipline, e.g., Chemical, Civil, Electrical, or Mechanical. Combined examinations were eliminated in 1994.

At that time (1989), the Committee on Examinations for Professional Engineers was studying the passing percentage variations from administration to administration. While some variation could be attributed to varying candidate capabilities, the committee report stated that, "Approaches to provide more effective control over the degree of difficulty from examination to examination are being explored."

At the 1989 Annual Meeting, the Council voted to modify the PE examination (Group I) to allow 50 percent of the examination to be in the objectively scored format effective with the October 1990 examinations.

A new set of examination specifications based on a new task analysis of professional activities which engineers perform at the time of entry into the profession and the knowledge necessary to perform these activities also were adopted at the 1989 meeting. The new specifications were implemented with the October 1991 examinations.

In 1990, PE Group II moved to 25 percent machine-scorable questions and then to 50 percent in October 1993.

FE Examination Studied

In 1992, an FE review committee was established and met with ABET, ASEE, NSPE, and the Deans' Council to discuss the construction, grading, and use of the examination. A joint task force composed of representatives from these organizations created a "continuing framework for interaction," according to President William L. Karr. The overall objective of the joint task force was to evaluate and recommend modifications to the examination so that it could more broadly measure outcomes of the total engineering education experience. (This came at a time of increased usage of all examinations in the face of declining college enrollment.)

The task force began work to develop an engineer's competency assessment examination, a modification of the FE examination. The goal was to develop a single examination that could be taken by each engineering graduate to 1) evaluate competency at that point in his or her career *and* 2) provide feedback to the institutions as one aspect of the effectiveness of their engineering education process. Thus, all new graduates would have an opportunity to begin the licensure process based on their scores on all or a subset of such an examination. The task force visualized an examination that would include engineering discipline questions (Chemical, Civil, Mechanical, Electrical, Industrial), as well as fundamental questions (Mathematics, Statics, and Dynamics, etc.).

In 1994, the Council voted to change to the new FE examination format recommended by the task force, and in 1995, it adopted a new procedure for allowing new discipline-specific modules to be added to the examination.

The Council also had begun moving toward breadth and depth examinations, following a long-standing recommendation by Dr. Wiley Boyles. The Committee on Examination Policy and Procedures (EPP) reviewed other professions and found that comparable examinations in the

medical, legal, architectural, and accounting professions did not provide for candidate choice in the selection of test items. In 1995, the Council voted to change the PE examinations (Group I) to a breadth and depth format, testing four hours on the breadth of knowledge and four hours on the depth of knowledge, beginning no sooner than the 1998 examinations.

Expanding/Refining Examinations and Procedures

The 1995 Council voted to modify the conditions under which the NCEES can offer examinations to foreign governments in an effort to recognize Member Board's rights in administering examinations in foreign jurisdictions while clarifying the Council's authority in approving the use of examinations by foreign entities. The modified policy allows Member Boards to continue to provide NCEES examinations directly to foreign jurisdictions. Member Boards also were charged with the responsibility of protecting the confidentially and security of the examinations rather than leaving that up to the university or foreign country.

The range of the NCEES continued to expand with the addition in 1995 of two new disciplines—Building Architectural Engineering and Ship Design Engineering—into examination status as Group II PE examinations.

The 1995 Council also approved a motion by the Committee on Examinations for Professional Surveyors to rewrite some test items to reflect competency with new technologies such as Global Positioning Systems, Global Information Systems, and Land Information Systems. The committee charged its successor with continuing to develop test items for these and other new and advancing technologies.

EPE Methodology

Because of the Council's mandate to protect the public welfare, and because the NCEES examinations are designed to measure minimum competency for licensure, a summary of the methodology of the Committee on Examinations for Professional Engineers (EPE) is of interest here:

> One hundred members and consultants meet in Clemson, South Carolina at NCEES Headquarters several times each year [12 in 1990–1991]. These meetings are to train professional engineers in writing acceptable problems for the examination, to review and revise submitted problems, to compose the examinations, to carefully review each examination before its administration and to analyze the performance of each examination so that we can improve the quality and reliability of the examination. (Abstract, Committee on Examinations for Professional Engineers.)

This represents just part of the work of the committee, which is only *one* of several Council committees involved in some aspect of the examination process, and committee activity does not include the enormous amount of time spent on grading the examinations.

It is obvious that the validity and other refinements of the licensing examination will become more important in the 21st century, with other countries looking toward the U.S. as a model for possible licensing programs. At present, the U.S. and Philippines are the only countries in the world with a formal examination/licensure mechanism. (While licensure is a jurisdictional activity, all boards use the NCEES Fundamentals of Engineering and Professional Engineering examinations as a basis for licensure.)

This brings us to what is perhaps the ultimate issue for the NCEES in the 21st century: what is to be its role in the worldwide growth of the engineering and surveying profession?

The Internationalization of Professional Engineering

In 1984, the Committee on International Relations report stated that there was "no constituency [within the Council] to support an international relations conference." The Council's relations with other countries at that time seemed primarily to consist of seeking information on which to evaluate education qualifications. By 1995, the NCEES was poised on the brink of worldwide leadership in the arena of international engineering licensure. Indeed, one cornerstone of the new 1995 Strategic Plan was to "Enter into discussions with appropriate (foreign nations) international groups concerning possible formation of an umbrella organization of foreign government recognized licensure systems."

The implementation of the free trade agreement with Canada prompted the NCEES, along with ABET and NSPE, to form the United States Council for International Engineering Practice (USCIEP) to act as an umbrella entity for international negotiations. The effectiveness of the new umbrella council was proved in its recognition by the U.S. Trade Representative's Office as "the professional body pursuant [the U.S. authorized representative] to the North American Free Trade Agreement." NAFTA provides for developing an agreement on cross-border trade in services, including trade in engineering services. The Council had been thrust into a leadership role, responsible along with representatives from Mexico and Canada for developing mutually acceptable standards and criteria for licensing and certification and making recommendations on mutual recognition.

"Foreign Policy" Evolves

The Council's "foreign policy" evolved from the 1984 position (in which essentially one person was evaluating foreign education programs) on through several years of exploring how to achieve that task more systematically and more consistently with court rulings, to world leadership in the engineering examination process and participation in a three-nation forum discussing educational equivalency as well as examination, experience, ethics, professional development, scope of practice, local knowledge, and consumer protection. The transition is somewhat dizzying if one is unfamiliar with how resilient the Council has been in its 75-year history: it works things out.

Tracing this transition over the past decade reveals the process by which the Council evolves into solutions through the work of its committees, the voting of the members at large, and the dedication of individuals at the helm of specific directions taken.

In 1984, a Committee on International Relations report stated that there was "very little interest by Canadians in simplifying procedures for United States engineers to become registered in Canada." It was reaffirmed that "the number one priority of this committee is the evaluation process for foreign candidates." It was stated that the NCEE should not sponsor or initiate an international conference: that it would not be cost effective and that the Council did not have a constituency which would support such actions.

A subcommittee report pointed out specifically why evaluation of foreign candidates' education was a concern: it was important to the viability of the licensure process that the Council "develop and assemble information needed by state boards to *maintain a defensible and uniform response to these [foreign] candidates*." (italics added)

Indeed, a later court case in Michigan found that the board had relegated its legislated duty of evaluation to an outside entity. Furthermore, no state had a law or regulation concerning liability of foreign engineers for damages caused by professional engineering error—the board could only revoke licenses. Another instance was that the Maryland Board had no written criteria by which to measure foreign education, and therefore no legal basis, they were counseled, on which to disapprove them. Thus, there were serious legal aspects which were of legitimate concern to Member Boards in their dilemma concerning foreign applicants.

Foreign Education Evaluation

At this time, the board's international relations centered primarily around what role to play in advising or facilitating Member Boards' processing the growing number of foreign applications, not only concerning education equivalency but also experience equivalency. The Council's involvement was, of course, based on its objective to promote uniform licensure. Uniformity of evaluation was needed and would obviously require time and resources beyond the scope of individual boards to arrive at fair, consistent, and legally defensible criteria for evaluation.

(An interesting artifact appears at this time in the 1985 committee reports. The Committee on International Relations had earlier adopted a resolution to delete references to a foreign engineer's explicit need for proficiency in the English language. The committee felt that as long as the engineering examinations are taken and answered in English, they constitute a sufficient examination in the English language.)

The issues coalesced into three parts: (1) how to compare foreign engineering education to that of the U.S.; (2) how to compare foreign experience to U.S. experience; and (3) how to word a legally defensible board regulation relating to these evaluations.

A Council survey indicated that evaluation of foreign education was the top service needed by boards but not being supplied by the Council. This area was a major problem for the boards, with 70 to 80 percent indicating that they needed more assistance from the Council.

Two factors emerged. While there were existing evaluation services, these organizations did not evaluate the *quality* of engineering education programs; they gave quantitative information on course content and validated transcripts. Second, the Council needed to avoid developing "an approved list" of foreign schools. Member Boards were legally responsible for making their own independent judgments, simply using others' data as information, thus avoiding the pitfall of the Illinois Dental Board. (An appellate court had ruled that the board had unconstitutionally delegated its authority to decide whether graduates of certain dental schools could sit for examinations.)

The Council voted to hire a consultant to collect data and report on foreign education programs, with the purpose of developing criteria and a database (available to Member Boards) to measure quality and to recommend minimum acceptable standards. (O. B. Curtis had worked for many years as a one-man operation to gather, in the form of pamphlets, information on foreign curricula. The job now had become far too complex for this method.)

By 1988, the Committee on International Relations had surveyed Member Boards on procedures followed in evaluating foreign or non-ABET transcripts. There was concern that there might be "too great a diversity" in the procedures being followed, and hence, an evolving controversy between jurisdictions having "weak" and those having "tough" standards, complicating reciprocity.

The Michigan Board established a unique method of evaluating both foreign and domestic transcripts: an Advisory Committee on Educational Credentials, composed of

members from the eight engineering institutions in that state offering ABET curricula and chaired by a board member. Opinions were based on the evaluators' first-hand knowledge of performance of graduate or transfer students from the institution in question. Florida had created a similar program.

In 1990, the Committee on International Relations reported the "first step toward mutual recognition of accredited educational programs in Europe, the United States, and Canada, which promises to cut down on the amount of special transcript evaluations burdening the Member Boards." This step consisted of negotiations between ABET/NCEES/NSPE and Ireland to recognize educational equivalency.

PEFSAD Formulated

That same year, the Council approved "Procedures for Evaluation of Foreign Schools and Degrees (PEFSAD)" proposed by the Committee on International Relations, thus successfully concluding an exploration which had been problematic for years. Procedures included establishing a clearinghouse of information on foreign schools and engineering degrees and creating a database for use by the boards. Evaluators were to be professional engineers from industry and from academia, the latter of which would have experience on ABET evaluations. The criteria included: admission policies, number of engineering disciplines, number of full professors and teaching loads, type of institution (state, district, or local), research activities, length of scholastic year, class size, degree requirements and number awarded, library facilities, graduate degrees, and age of institution.

In short, the criteria for rating foreign schools were essentially the same as those for U.S. institutions of higher learning.

By 1993, the Committee on International Relations had decided that ABET was the appropriate organization to evaluate foreign degrees but later changed this decision. The Council would still compile a database from these applications to be available to the Member Boards. The committee had identified eight countries of highest priority regarding information in licensure procedures (Canada, India, Mexico, the United Kingdom, China, Japan, the Philippines, and Russia.)

In 1994, the committee adopted a detailed resolution establishing a procedure for the evaluation of foreign engineering degrees. The Committee on Foreign Engineering Education Evaluation Program (FEEEP) identified the American Association of Collegiate Registrars and Admissions Officers (AACRAO) as the organization to help evaluate foreign engineering education.

Applicants from programs conducted outside the United States and not subject to Washington Accord recognition would be advised to contact the NCEES for evaluation of their engineering credentials. The NCEES, in turn, would rely on an AACRAO evaluation to determine whether or not the education appeared to satisfy requirements of an ABET-accredited program. The completed evaluation would then be forwarded to the appropriate jurisdiction for determination of whether the education met its local requirements.

U.S. Licensure in an International Market

In 1991, the Committee on International Relations reported on its charge of tabulating and analyzing other countries' regulation of engineering and their laws, rules, regulations, and codes of conduct. It was to compare these with the NCEES *Model Law, Model Rules of Professional Conduct*, etc. and develop a format for reporting data to Member Boards.

The committee also had been charged with developing a draft policy on NCEES' role in international activities. The policy they drafted was that "The NCEES proactively monitor, evaluate, and document registration requirements of other countries."

The countries tabulated were Belgium, Germany, Denmark, Spain, France, the United Kingdom, Greece, Italy, Ireland, and the Netherlands. With a few exceptions where a degree is required, there appeared to be few restrictions on the practice of engineering in these countries.

The U.S. system of licensing professional engineers, according to the committee on the study of the U.S. Recognized Engineers, was considered to be the most rigorous system in the world in setting standards for competency and in the regulation of the practice of engineering to protect the welfare of the public. Surely, this system was destined as a pace-setter in the internationalization of engineering.

In fact, by 1992, it was reported that the Council had received inquiries from Russia, Israel, and Japan about the use of the examination (potentially a new source of revenue) and that Japan was interested in establishing a registration process based on an examination similar to the Council's. President William L. Karr reported that an interim agreement with Canada had been signed but that examinations were a key stumbling block to a final agreement. Karr expressed the belief that a final agreement would "most likely be used as the starting place for all other international agreements that the Council will be involved with."

In negotiations with other countries, because most of them did not include an examination in their licensure process, the issue was whether or not experience could be substituted for examinations, and, if so, how many years. USCIEP had recommended 15 years of post-baccalaureate progressive engineering experience.

The paradox was that on the one hand the Council feared a dismantling of the licensure process based on examinations which it had painstakingly developed over a period of decades, and on the other hand it was looking at a potential new source of revenue from countries appreciating that same process.

The Committee on International Relations was developing "criteria and procedures for licensing 'broadly experienced practitioners' who fail to meet normative standards for licensure." It was also to promote awareness of the licensure process through attendance at international meetings.

In 1994, the committee proposed amendments to the Constitution and Bylaws to provide for membership of international organizations in the Council. Motions to approve these amendments failed; however, similar proposals continued to be discussed.

Thus, with the approval of PEFSAD and the recognition of USCIEP by the U.S. Trade Representative's Office as a negotiating body, the National Council was ready to step into the international engineering arena of the 21st century.

USCIEP Begins Meeting

Late in 1988, international relations had begun to mean something considerably more than the evaluation of foreign education and experience. The U.S. Council for International Engineering Practice started meeting on a regular basis, with a significant phrase added to the "public welfare" dictum, symbolizing new horizons.

The Canadian Council of Professional Engineers (CCPE) had informed the NCEE, NSPE, and ABET that CCPE was the designated Canadian organization to negotiate the Professional Engineering Services section of the North American Free Trade Agreement and asked whom they

should be meeting with in the U.S. The three U.S. organizations agreed that they should be the negotiators and formed the USCIEP, which consisted of two members from each of the three groups. The NCEES was to chair the new council, with headquarters to be at the NCEES office in Clemson, South Carolina. The executive director of the NCEES was to serve as the secretary-general of USCIEP.

In its constitution, the USCIEP defines its purpose, in part, as follows:

> USCIEP shall identify the constraints to the right to practice engineering *internationally* (italics added) and shall recommend to the appropriate jurisdictions procedures to minimize the impact of these constraints. These efforts are to be undertaken for the welfare of the public in safeguarding life, health and property and for the *benefit of humanity* (italics added). (Article II - Purpose, Section 1)

The italicized phrases clearly are international in scope and point the way to the Council's role in the 21st century.

In his 1989 President's Report, Charles L. Kimberling, who along with President-Elect Dave Sellards composed the Council's first contingent to USCIEP, said that discussions and actions were occurring by ABET, NSPE, and the Council with organizations from not only Canada but also Australia, Ireland, New Zealand, the United Kingdom, Belgium, Pan America, and Europe, as well as the World Federation of Engineering and the U.N. Educational and Scientific Organization.

Proactive Stance Recommended

Kimberling's statements indicate a dynamic entry into the international arena. He recommended that the Council develop a *proactive* instead of a reactive posture to other engineering organizations. The President pointed out that many activities were "occurring between organizations that affect professional engineers on a worldwide basis," and that engineering board regulations must be protected. The Council, which had labored for seven decades to establish a firm foundation (education/examination/experience) upon which to assure professionalism in the U.S., was to continue its efforts worldwide.

The U.S.-Canadian Free Trade Agreement marked the first time that professional services had been incorporated into such an agreement. The official title was "Interim Statement of Principles for the Mutual Recognition of Registered Professional Engineers by State, Provincial, and Territorial Authorities to Facilitate Mobility in Accordance with the Canada/United States Free Trade Agreement."

Requirements to practice were similar in the two countries (good moral character, appropriate education, experience) except for the examination requirement by the United States, absent in Canada's regulations. The agreement stated that licensure by endorsement was possible if the applicant, among other qualifications not including the examination, had 15 years of licensed practice.

The first trilateral discussions between Canada, the United States, and Mexico concerning the North American Free Trade Agreement occurred in 1993, with USCIEP representing the United States. A proposed Professional Engineers Council of North America would consist of a nine-member executive committee of three representatives each from the United States, Canada, and Mexico.

NAFTA Negotiations Working

Under NAFTA, at this writing, Canadian and Mexican citizens will not be allowed to practice in the United States unless they meet the licensing requirements of the jurisdiction in which they seek to practice. Because NAFTA is an agreement rather than a treaty, all U.S. laws will remain in effect.

NAFTA stipulates that signatories shall encourage the development of mutually acceptable criteria for licensing and certification which may include education, examinations, experience, professional development, etc.; in short, the concepts which the Council has promoted successfully.

At this writing, negotiations appear to be working. Mexico is instituting an accrediting system which promises to be acceptable and has rescinded its constitutional requirements that professional engineers be citizens. Similarly, the Council has shown flexibility in interpreting the Model Law by approving Professional Policy (PP) 18, allowing competency to be validated by licensed experience rather than examination.

Another encouraging step is that the National Science Foundation funded a program on "Conduct and Ethics in Engineering Practice Related to the North American Free Trade Agreement," the purpose of which was to develop recommendations on issues related to conduct and ethics.

In 1995, USCIEP, together with its Canadian and Mexican counterparts (CCPE and COMPII, respectively), approved a historic Mutual Recognition Document (MRD) which spelled out requirements for temporary licensure (up to three years) of engineers among the various cross-border jurisdictions of the three countries. Among other things, the document allows for the recognition of licensed experience in lieu of examinations. This is particularly important in terms of mutual recognition, since neither Canada nor Mexico requires examinations for licensure.

In recommending that the NCEES ratify the MRD, USCIEP emphasized that the document in no way changes the authority or responsibility of local jurisdictions to regulate the practice of engineering, including the use of examinations, and that "Jurisdictions will be encouraged (but not forced) to implement the provisions of the document in the same manner as the NCEES *Model Law*."

At the 1995 NCEES Annual Meeting, however, strong reservations were raised about the legal implications of the MRD. In particular, some delegates felt the agreement might undercut jurisdictions' authority to use written examinations as a prerequisite to licensure.

In urging ratification of the document, Dave Dorchester, a Texas Board member and NSPE representative to USCIEP, said, "None of us can say that we are not entering into a world arena where engineering is going to cross the borders. The United States has the possibility of continuing in a leadership role and taking part in trade across borders. We either need to continue and accept our leadership role in encouraging the practice of engineering across borders, or we should isolate ourselves and not participate in the international arena. This would be hurtful to the engineering profession in the United States…."

John Beyke of the Kentucky Board agreed, saying, "The MRD…is in the best interest of the profession. It is a good marketing strategy. There is obviously more opportunity for U.S. engineers in Canada and Mexico than there is for Canadians and Mexicans in the United States. If we can defend an ABET accredited degree and 16 hours of testing as being in the best interest of the public, then we can fight that battle if it occurs."

After much discussion, the Council voted for a two-year approval of the MRD, during which time the Board of Directors was charged with obtaining legal counsel on the long-term legal ramifications of the document.

The 1995 Council also voted to create and appoint NCEES surveyor members to a joint committee with NSPS and ABET to develop a similar NAFTA mutual recognition agreement for professional land surveyors in the United States, Canada, and Mexico.

Other Developments

At this writing, the three subjects discussed above are of paramount importance as the Council moves into the 21st century; however, other developments which represent ongoing concerns of the Council were also noteworthy.

Perhaps the most visible was the name change from the National Council of Engineering Examiners to the National Council of Examiners for Engineering and Surveying, which was approved by members at the 1989 Annual Meeting. This was done in recognition of the fact that members are involved in the regulation of both engineering and surveying.

In 1995, the Council approved a "complete overhaul" of the definition of land surveying that recognizes the evolution of technology, practice, knowledge, credentials, and more diverse practice of surveyors. The expanding current practice of surveyors was redefined to include: "providing professional services such as consultation, investigation, testimony, evaluation, planning, mapping, assembling, and interpreting reliable scientific measurements and information relative to the location, size, shape, or physical features of the earth, improvements on the earth, the space above the earth, or any part of the earth, and the utilization and development of these facts and interpretation into an orderly survey map, plan, report, description, or project."

The Records Verification Program was expected to grow "at an astounding rate" over the coming years, reflecting the increasing mobility of the profession. A new system that allowed optical scanning into an imaging database was expected ultimately to eliminate the need for hard copy. The database was envisioned as a possible nucleus of an online national database of licensed professional engineers.

A Law Enforcement Reporting System became operational, with a database on disciplinary actions taken against P.E.'s and L.S.'s. Before issuing a license, a board could determine if there were offenses recorded in other jurisdictions. By 1994, more than 900 records from 39 boards, accounting for 2,000 offenses, were in the system.

The headquarters at Clemson, South Carolina, was expanded, providing conference rooms, five dedicated meeting rooms, ample space for examination department personnel, and office space to accommodate future growth. Total contract was $875,344.

In 1993, the Council approved changes in PP 15—Continuing Professional Competency, rescinding a former stand. The new policy stated in part that the NCEES "endorses continuing professional competency as a guideline for the evaluation for registrants' voluntary activities in continuing professional competency for the maintenance of professional competency." The Committee on Education Assessment and Qualifications stated that it wanted to recognize that there was "a change or transition occurring" and that most boards were "becoming active" in the area of continuing education and continuing competency. Continuing professional competency guidelines were formulated.

A Continuing Professional Competency (CPC) handbook was published in 1995 to help jurisdictions develop programs for CPC, simplify reporting of CPC units by individual licensees,

and make it easier for licensees in multiple jurisdictions to meet the reciprocal requirements of each jurisdiction.

By 1994, there were a total 641,041 engineering licenses in the United States among 70 Member Boards. Twenty-three professional societies participated in the Council. The total operating income was $5,089,700. Twenty-four committees composed of more than 400 members carried out the Council's activities.

GODSPEED

In light of the enormous power of technology for good or bad, it is chilling to hear anyone speak of lowering standards for the practice of engineering. If anything, they should be ever more stringent. Technology, the end product of engineering, is never going to decrease; its nature is to grow more complex and pervasive. As technology advances and business and industry become more multinational, society is likely to need more finely honed, not more lenient, licensure laws.

President John Lyons, in his 1991 President's Report, summed up several concerns which the Council would no doubt carry into the next century: (1) the elimination of the examination was being advocated by some "influential engineers," (2) reciprocal licensing with other countries was going to bring pressure since U.S. minimum standards are more stringent than elsewhere, and (3) continued negotiation of trade agreements might mean attempts on the part of the political sector to mandate changes in licensure laws.

The question globally in 1995 was (just as it had been 75 years earlier when the Council was first organized), "Who is qualified to practice engineering in such a way that the public welfare is protected?" The qualifications surely must remain education, experience, and examination—the common-sense, pragmatic touchstones of competency which the Council has faithfully promoted throughout the years.

Furthermore, with monumental technological advances such as space travel, nuclear innovations, etc., the dedication of the Council was going to be needed ever more.

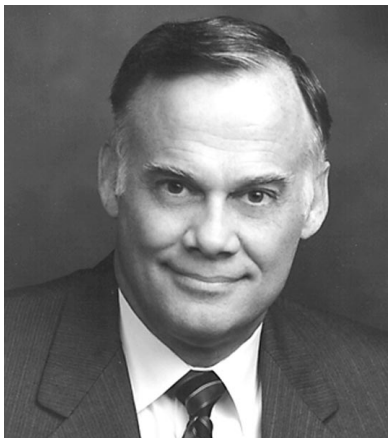
The Council unquestionably is to be a pacesetter as the professional practice of engineering and surveying spreads across the world—and farther—in the 21st century. One already can see the influence of the Council as its values emerge in trade agreements and as its examinations are courted by other countries.

The Council is an example of democracy at its best, as it studies, weighs, and compromises, always moving toward solutions which work in the real world. Its methodology, as well as its values and goals, can be an inspiration to other countries.

During the century now ending, the Council represented an inestimable number of work hours and the dedication of many of the most talented professionals in the country.

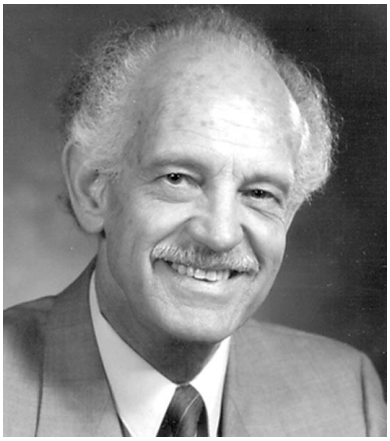
It is hoped that in the 21st century, this fine organization will continue to devote its energy, talent, and integrity to shaping the profession of engineering and surveying—"for the benefit of humanity."

Paul R. Munger
Missouri
1983–1984



Sam H. Wainwright
Alabama
1984–1985

Edward L. Pine
Nevada
1985–1986

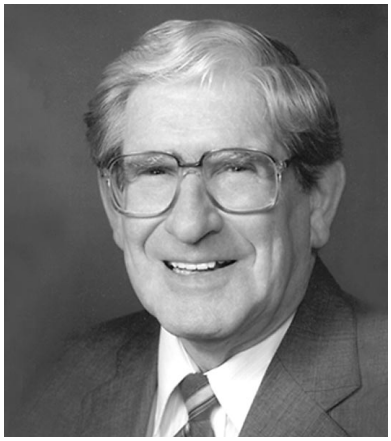


J. Harry Parker
Massachusetts
1986–1987

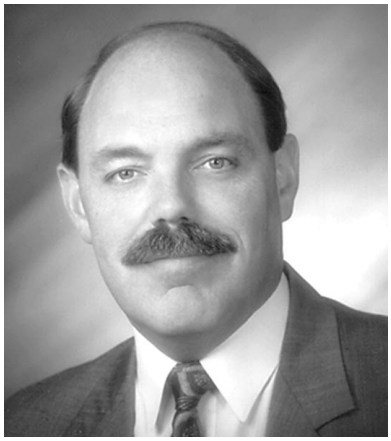
Dennis F. Meyer
North Dakota
1987–1988

Charles L. Kimberling
Oklahoma
1988–1989

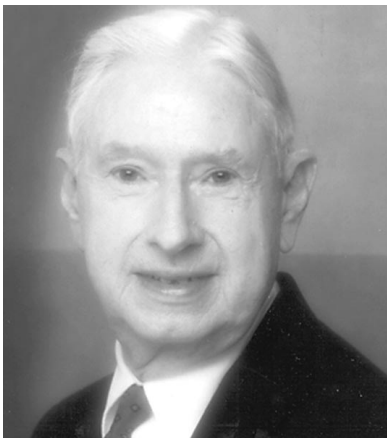
George D. Sellards
Colorado
1989–1990



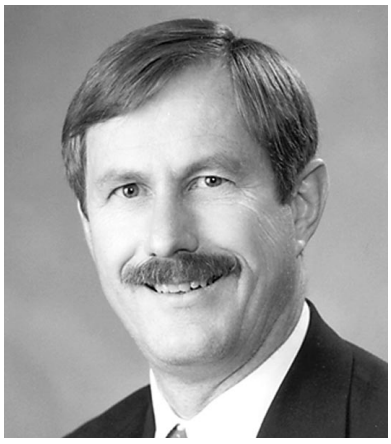
John E. Lyons
New Hampshire
1990–1991



William L. Karr
Michigan
1991–1992



Paul Taylor
Alabama
1992–1993



John Steadman
Wyoming
1993–1994

Leon H. Clary
New York
1994–1995

Warren L. Fisk
South Dakota
1995–1996

CHAPTER 6
Broadening Scope of the Council
1996–2004

In the last decade, the Council has reexamined a number of core areas, including its own structure, the format of its examinations, and the licensure process itself.

Special Committee Reviews Council Structure and Operation

In 1997, newly elected President Steven T. Schenk, P.E., formed a Special Committee on Governance dedicated to performing an in-depth review of the overall structure and operation of the Council. The committee spent considerable time examining NCEES operations, processes, and structures. Processes included such issues as setting the direction for the Council, allocating resources, establishing policy, and building consensus for action. Structures involved the framework upon which the processes operate, such as the delegate assembly, the governing board, and board committees.

Between September 1997 and January 1998, the Special Committee on Governance met four times to develop its initial recommendations. Because the committee members came from such diverse backgrounds and the issues were so complex, the Council decided to bring in a consultant who had considerable experience in facilitating governance reviews with other organizations. This was the first time in the Council's recent history that a facilitator had been used, but her efforts proved invaluable. As the meetings progressed, the diversity that initially divided the members gave way to a bond that united them around common issues and solutions. In addition to their own viewpoints that the members brought to the table, they also sought and received considerable input from Council officers, committee chairs, and various members of the Council. Furthermore, the members compared the Council's current governance structure with other governance models.

At the 1998 spring zone meetings and the Annual Meeting in August, the Governance Committee held informal town meetings with NCEES delegates in order to present its preliminary findings and receive input from the members. The committee's primary recommendations included changing the election of the President from regional rotation to purely qualifications-based criteria, doing away with certain standing committees and replacing them with networking groups, and empowering the Board of Directors to make day-to-day operational decisions. These town meetings proved highly beneficial in ascertaining the concerns delegates had in regard to the recommended changes.

Following the 1998 Annual Meeting, President Andrew B. Liston, P.E., P.L.S., referred the Governance Committee recommendations to the Constitution and Bylaws (C&B) Committee. After nearly a year of deliberation, the C&B Committee presented a slate of governance motions before the Council at the 1999 spring zone meetings and the 1999 Annual Meeting held in Buffalo, New York. When Council membership deliberated the C&B motions at the business session in Buffalo, much opposition arose. Delegates indicated that they had not received

sufficient information to make a wise voting decision. Various Council members attending the meeting remarked later that the delegates appeared to view the governance changes as coming from the "top" of the organization, rather than from the "bottom." As the motions began to be presented, they were summarily voted down. Reflecting on that time, former Governance Committee member Jerry Carter (North Carolina Board Executive Director from 1992 to 2001) remarked, "The motions under consideration were complex and confusing. The delegates did not have the depth of information available to them that the committee members had."

When it became evident that all C&B motions would be voted down, President Andrew Liston requested that all the amendments be pulled from formal voting and, instead, be put to a "straw" vote to see where the Council members stood on the issues. This unprecedented decision proved highly successful as everyone then had a chance to give his or her opinion on an issue without making a binding decision. After this straw vote, the recommendations were sent back to the C&B Committee for revision for the following year.

At the 2000 Annual Meeting in Chicago, the C&B Committee presented a revised version of the initiatives. The more controversial issues, such as the election of the President, were left as they stood previously. However, this revised version did include many of the issues that the delegates had indicated were important to them in the straw vote, and this version passed without dissension. Various changes resulting from Governance Committee recommendations, passed in 2000 or 2001, are listed below:

- Enable Past Presidents to serve on committees.
- Include the Executive Director as an officer of the Board of Directors, serving as Secretary of the Corporation.
- Acknowledge the slate of zone officers elected at the spring zone meetings, rather than holding a second election at the Annual Meeting.
- Eliminate the following standing committees: Communications, International Relations, Member Board Administrators (networking group established in its place), Professionalism and Ethics, and Records Verification.
- Empower the Board of Directors to select the site location for the Annual Meeting with the Council's ratification.
- Separate operational procedures from the *Policy Manual*, empowering the Board to make day-to-day decisions while retaining Council policy in the hands of membership at large.

Although the Special Committee on Governance no longer exists formally, many of the initiatives it recommended are still being considered and evaluated for their value to the Council. Through its proceedings and the presentation of its recommendations, one thing became clear: members want to be involved in the Council decision-making process, no matter how small the issue. Other lessons learned include that change in large organizations is oftentimes better effected through smaller, incremental steps than larger, sweeping ones, and communication about such proposed change must be ongoing.

Strategic Plan Updated

Throughout the years 1995 to 2003, NCEES developed, revised, refined, and revamped its Strategic Plan. The energy invested in the strategic planning process reflects the Council's emphasis

on preparation for the future and long-term goals. As the Strategic Plan improved with each revision, so did the strategic planning process itself, soliciting and incorporating more input from Council leaders and grass-roots membership.

At the 1995 Annual Meeting, President Leon H. Clary, P.E., L.S., included a motion in his president's report that the delegate body approve the Strategic Plan developed by the Board of Directors from June 1994 to August 1995. The motion passed. The plan had been presented for review and comment at the February 1995 Board Presidents' Assembly and the spring zone meetings. Clary wrote in his report, "the Strategic Plan is to be used as a guiding light and thought process by all of the committees of the Council….I recommend that the Council approve this document so that it may be referred to each committee in order for them to do a self-assessment of their activities, prepare a substrategic plan of their own, and refine their charges to meet these guiding principles." Clary continues, "The individual committee plans should be submitted to the Board of Directors for approval. The Strategic Plan should be reviewed by the Board of Directors at least every two years for refinement in order to keep up with our changing society." The Strategic Plan included vision and mission statements as well as domestic and global key strategies. The concluding sentence of the plan speaks to Council committees: "…with these strategies and items for consideration taken into account, each committee should come up with its own substrategic plan to act as it own guiding light."

In accordance with the 1995 Strategic Plan, President Warren L. Fisk, P.E., L.S., charged each standing committee to "review the Strategic Plan for the Council and develop a short-range action plan for the committee, keeping in line with the Long-Range Strategic Plan." Committees responded to charges in the *1996 Convention Reports*.

Commissioned at the 1996 Annual Meeting, President L. G. "Skip" Lewis Jr., P.E., tasked the Advisory Committee on Council Activities (ACCA) with completing the Strategic Plan by incorporating each standing committee's short-range action plan. In addition, ACCA developed key strategy statements to give direction to the short-range action plans. The introduction to the 1997 Strategic Plan stressed its overall purpose: "the plan should be the guiding force for all committees, and all committee charges should be assessed against the plan's objectives and strategies." The introduction stipulated that the plan should be reviewed every two years and that ACCA is the "body that should be responsible for ensuring continuing currency of the plan." The plan identified key domestic and global strategies, action items, and standing committees that should develop short-range action plans, consistent with the Strategic Plan, to provide guidelines for implementation. At its Annual Meeting, the Council adopted the 1997 Strategic Plan.

Based on provisions of the 1997 Strategic Plan, President Steven T. Schenk, P.E., charged ACCA with reviewing the committees' short-range action plans and recommending revisions to the plan as necessary. ACCA presented the updated 1997 Strategic Plan at the 1998 Annual Meeting. Built on the framework devised in 1997, the 1998 update included detailed action items and action plans under the domestic and global strategies.

The 1998–1999 ACCA Committee was tasked by President Andrew B. Liston, P.E., P.L.S., with developing a "proposal for a strategic planning session that will involve the broad membership of the Council." ACCA responded in its 1999 report with a "guide for developing and refining a strategic plan, as well as for dealing with a major issue that might come before the Council." The guide contained 10 points, stating that it should take two years to implement it. ACCA prefaced its guide with the following, "It should be noted that the more effort devoted to establishing buy-in, the more successful the outcome or product will be." The guide's 10 points are as follows.

- Obtain support and commitment of the leadership.
- Identify a consultant/facilitator.
- Finalize process (steps/timeframe) to include input and feedback from a variety of stakeholders.
- Identify a cross section of stakeholders and champions to be part of the planning team.
- Agree on the mandates of the organization.
- Conduct an environmental analysis/scan (internal and external). This could be completed via questionnaire and/or focus groups.
- Conduct a planning team retreat (or series thereof) to analyze and review environmental feedback, strengths, weaknesses, opportunities, threats, vision, and mission; determine goals, strategic objectives, a five-year plan complete with implications on current programs, structure, finances, and the like; and develop an operating plan.
- Seek feedback, buy-in, and approval of all stakeholders.
- Implement.
- Monitor and update annually.

The Council began addressing the Strategic Plan again in fiscal year 2000–2001. To get input from all members of Member Boards, NCEES distributed a strategic planning survey to its membership. The results were compiled for analysis by the ACCA Committee, which President J. Richard Cottingham, P.E., P.L.S., tasked with developing a draft update to the Strategic Plan. With the help of a facilitator, the ACCA Committee gathered input on potential NCEES goals and objectives at the 2001 Board Presidents'/MBA Assembly. ACCA presented a draft Strategic Plan at the 2001 Annual Meeting, based on feedback from the 2000 President's Planning Meeting, the 2001 Board Presidents'/MBA Assembly, and the Member Survey. The Council approved the draft in concept.

The following year, 2001–2001, President Ted C. Fairfield, P.E., charged the ACCA Committee to "review the NCEES name along with its vision and mission statements for relevance as they relate to the NCEES strategic plan and the Council's expanding scope of products and services." As the committee proceeded with its charge, it became apparent that one year was not sufficient to gather input from the Council and incorporate it in the plan. President-Elect Robert C. Krebs, P.E., L.S., agreed that the charge should be continued for the 2002–2003 year. The ACCA report states, "ACCA and the President do not want to rush to a conclusion that is not well reasoned and that does not show the result of significant involvement of members outside ACCA."

At the February 2002 Board Presidents'/MBA Assembly, ACCA, with the assistance of a facilitator, involved attendees in discussions and breakout group sessions regarding the NCEES name, vision, mission, and the Strategic Plan. Attendees identified issues of importance for NCEES to pursue. In May 2002, the committee distributed a blind survey to the Board of Directors. Through this survey, the Directors indicated the direction they felt NCEES should take on the issues of importance. At the 2002 Annual Meeting, ACCA and a facilitator sponsored breakout sessions similar to those at the 2002 Board Presidents'/MBA Assembly to involve NCEES leadership who were not at the February assembly.

For the 2002–2003 year, President Robert C. Krebs assigned ACCA with an all-encompassing charge: complete the strategic planning process begun in 2001–2002. In the 2003 ACCA report, the

first sentence under the charge reads, "in completing this charge, a primary goal of ACCA was to involve all Member Boards in the strategic planning process." ACCA used the information gathered at the Annual Meeting workshops and from the blind survey to complete a minisurvey to distribute to members of Member Boards. This survey involved all members of the Council, not just leadership who attended the 2002 meetings. From the data gathered, the ACCA Committee developed a strategic plan. It presented the plan at the 2003 Annual Meeting, and the Council approved it with no discussion.

There is no doubt that the Council will continue the strategic planning process. Its need to prepare for the future is ongoing, and its leaders have the foresight to meet this challenge. The end of the 2003 Strategic Plan reads, "The implementation schedule provides a system for continual monitoring of the effectiveness of the strategic plan. The President, Board of Directors, and Executive Director will review the activities to evaluate whether the issues and approaches need to be updated or revised with input from Member Boards."

Updates to the Strategic Plan will be made at Annual Meetings, Board Presidents' Assemblies, and zone meetings. It will become the focus of planning for the coming year at the President's Planning Meeting. The current version of the Strategic Plan is posted on the NCEES Web site on CouncilNet.

Task Forces Address Impediments to Licensure Mobility

Licensure mobility was the principal issue driving the formation of NCEES in 1921. In 2002–2003, President Ted Fairfield, P.E., suggested that the ideal professional license would function like a driver's license: issued by individual jurisdictions and accepted by all jurisdictions. Reality is far short of that model. Licensed engineering and surveying professionals must obtain licensure in one state, the state of original licensure, and then apply to any successive states for licensure by comity. They may or may not be approved. Realizing the frustrations inherent in this situation and the implicit obstructions to commerce, the Council began to closely readdress the licensure mobility issue through a variety of task forces.

In September 1999, President Dale W. Sall, P.E., L.S., appointed the Mobility Task Force and charged it with gathering, cataloging, and characterizing the serious impediments to licensure mobility. The Mobility Task Force was further charged with developing an agreement that could be signed by participating jurisdictions to help promote mobility between the jurisdictions and recommend other products or services that could improve mobility.

The task force concluded that identifying and characterizing the impediments to mobility was not particularly difficult. The two general categories that the impediments to licensure mobility fall into are (1) inability of an applicant to meet the unique jurisdictional legal requirements for issuance of a license, and (2) inability on the part of the licensing jurisdiction to process the application in as timely and efficient a manner as possible.

The first category of impediments comes about because of the differences in the statutory or administrative licensing laws in the various jurisdictions. Since its founding in 1920, NCEES has had as one of its primary goals the commonality of licensing laws in order to facilitate mobility. The NCEES *Model Law* is a document that presents recommended requirements for licensure in the areas of education, experience, and examination to serve as a model for Member Boards to use in developing statutory requirements for licensing in their individual jurisdictions. If all Member Boards were successful in convincing their respective legislative bodies to adopt the requirements of the *Model Law*,

licensure mobility would not be an issue. However, for a myriad of reasons, statutes in the jurisdictions differ from one another and they differ from the *Model Law*. These differences can become an impediment to mobility for a license holder in one jurisdiction seeking a license in another jurisdiction.

One of the major differences in jurisdictional statutes is the manner in which professional engineering licenses are issued. Jurisdictions fall into two categories: "generic" and "discipline." In the generic jurisdictions, license holders are licensed as professional engineers (P.E.'s) and are allowed to practice in any discipline in which they are competent. In some states they may be issued a certificate that specifies that they are "especially" qualified in the discipline in which they took the exam, but they are not otherwise restricted in their practice, except to areas of their competency. In the discipline jurisdictions, license holders are licensed as P.E.'s with a discipline designation, such as civil engineer or electrical engineer, and they are allowed to practice only in the aspects of engineering that fall within the statutory definition of that discipline. Impediments to mobility arise because some generic states do not keep a record of what discipline examination the licensee completed and thus cannot verify to a discipline state which exam the licensee passed. Mobility from a generic state to a discipline state can also be a problem if the discipline state does not license in the discipline of the exam that the licensee chose and passed.

Differences in the education component of the statutes impede licensure mobility as well. Some jurisdictions have no specific educational requirement for licensure, and some have implemented the *Model Law* requirement that licensure applicants graduate from a four-year program accredited by EAC/ABET. Between those ends of the spectrum are statutory requirements that can be met with a combination of education short of graduation from an EAC/ABET-accredited program and supplemental acceptable engineering experience.

The differences in the experience component of the statutes that lead to a lack of licensure mobility are less dramatic than those relating to education. For the most part, jurisdictions have adopted statutes that require a licensure applicant to have a minimum of four years of acceptable progressive engineering experience after graduation from an approved four-year engineering program or eight years of experience without a degree or with a degree other than engineering. However, at least one jurisdiction requires only two years of experience. Those persons who become licensed with less than four years of experience may find that their licenses are not mobile until they have accrued at least four years of experience. They may even find that regardless of how many years of experience they have, their licenses are not mobile simply because they took the Principles and Practice of Engineering (PE) exam with fewer than four years of experience—a circumstance contrary to the *Model Law*.

The other component of variability in the experience area is the determination by the reviewing state board of what constitutes acceptable experience. Some jurisdictions allow only design as qualifying experience. Others allow teaching upper-division college-level design subjects as qualifying experience but limit the number of years to something less than four. Some allow graduate education beyond the bachelor's degree to substitute for up to a year of experience, and some do not allow experience gained in government employment reviewing and analyzing the design work of licensed consulting engineers. Some of these differences can be attributed to the variability in the definition of the practice of engineering in the jurisdictional statutes, but some can be attributed to written or unwritten practices or policies of the state boards in interpreting the statutes.

Lack of licensure mobility can also be brought about by variability in the examination component of the statutes. Prior to May 1965, there was no national examination in the fundamentals of engineering; prior to December 1966, no national exam in professional

engineering; prior to April 1973, no national exam in the fundamentals of land surveying; and prior to April 1974, no national exam in professional land surveying. Although the NCEES national exams—Fundamentals of Engineering (FE), Fundamentals of Land Surveying (FLS), Principles and Practice of Engineering (PE), and Principles and Practice of Land Surveying (PLS) exams—have become the norm for most of the Member Boards, some do not use or recognize all of the discipline PE exams, some do not use the PLS exam, and some will not accept passage of a state exam taken after the date the jurisdiction began using the NCEES exams. Some jurisdictions will waive the requirement for passage of the FE exam for a licensure applicant with long-established practice, and some waive altogether the examination component if the applicant graduated from an EAC/ABET-accredited program in the jurisdiction and had a sufficient amount of acceptable experience. At least some impediments to licensure mobility will exist for any applicant who has not taken and passed both the FE or FLS exam and the PE or PLS exam. Additionally, a number of jurisdictions require supplemental, state-specific exams, dealing with issues such as frozen earth, seismic safety criteria, or unique land surveying systems. It is not likely that such special examination requirements will all be abandoned.

The second general category of impediments to licensure mobility is the manner in which comity applications are processed. Unlike the first category of impediments that often prevents licensure by comity, this category deals with the length of time between application for licensure by comity and approval thereof. Licensing boards have more direct control over this type of impediment than they do over statutory requirements.

Mobility Task Force members discussed the procedures their jurisdictions use to process an application for comity licensure and found a wide variation. Almost without exception, the authority to issue or not issue a license lies with the board. However, some boards have delegated more authority to their staff than other boards have. The general consensus of the members of the task force was that the more responsibility given to staff, the less time it takes to issue a comity license, thus increasing mobility. Task force members recognized that the primary responsibility of the board is to protect the public, but also that methods could be developed to speed the licensure-by-comity review and issuing process while still protecting the public. The task force suggested that Member Boards evaluate their licensure-by-comity review process and streamline it when possible.

The result of this evaluation would likely be the realization that the comity review process can be shortened in instances in which the applicant has traditional credentials for education, experience, and examination. Some examples of streamlining the process include the following:

- Obtaining support and commitment of the leadership
- Nearly instantaneous issuance of a license by comity to an applicant who has a Council Record and has been determined to meet the requirements of a Model Law Engineer or Surveyor
- Issuance of licenses by comity between regular board meetings after review by staff and concurrence by one board member that the credentials merit issuance of a license

The task force identified the Council Records Program, which has been in existence under one name or another since about 1923, as a service that will likely increase the mobility of a comity applicant's license. Its purpose is to facilitate licensure by comity for individuals holding a current license in at least one jurisdiction.

A Council Record is available to any person licensed by an NCEES Member Board. Those Recordholders who meet the requirements of the NCEES *Model Law* are designated Model Law Engineers (MLEs). This designation results in expeditious issuance of a license in several jurisdictions. For those applicants who do not meet the MLE requirements, the advantages of a Council Record are still many. Several jurisdictions have an abbreviated application process for Recordholders, such as completing only a minimal portion of the standard application. Since the Record contains transcripts, references, professional experience, and a verification of NCEES exams, the jurisdiction in which a license is sought by comity does not have to wait to receive and collate those items. Since the application is completed more rapidly, it can be processed more rapidly.

In 2000–2001, its second year of existence, the Mobility Task Force began the shift from strategic charges to tactical charges. The task force prepared a white paper entitled "Professional Mobility Enhancement through the NCEES Records Program" that described the program and how it could be advantageous to all stakeholders in professional licensing. The Council used the white paper to promote acceptance of the Records Program to potential Recordholders. The task force also prepared a white paper entitled "Effects of Business Registration Requirements on the Organizational Structure and Mobility of Engineering and Surveying Firms." This white paper pointed out some of the seemingly indefensible requirements for ownership and other conditions that are imposed by various jurisdictions on business entities. It explained how unreasonable those requirements are, forcing the creation of "shell" companies or other such artificial organizations that meet the legal mandate but which fail to fulfill the intended goal of public protection. The Council used this white paper to argue for the removal of, or argue against the imposition of, unreasonable requirements for issuance of a Business Entity Certificate of Authorization that do not serve to protect the public and that create a serious impediment to mobility. The task force suggested specific amendments to the *Model Law* that would expedite mobility and drafted a new Professional Policy and a new Position Statement, each of which addresses mobility and encourages jurisdictions to adopt practices and procedures for expedited comity licensure for MLEs. The Professional Policy and the Position Statement were adopted by the Council at the 2000 Annual Meeting.

In 2000, President J. Richard Cottingham, P.E., P.L.S, appointed a joint task force made up of Council members as well as members of the American Consulting Engineers Council (ACEC, later the American Council of Engineering Companies), chaired by President-Elect Ted Fairfield, P.E. This joint task force addressed charges relating primarily to some jurisdictions' policies of issuing Certificates of Authorization to companies (as opposed to individuals) that offer engineering or surveying services. The joint task force concluded that there were cumbersome and unnecessary impediments to the issuance of such certificates in many jurisdictions, and that this was a particularly serious impediment to comity in some states. While progress was being made in speeding up the issuance of licenses by comity to individuals, those gains were often offset by difficulties in achieving similar permission for their firms to practice in some jurisdictions.

In 2001, President Fairfield renamed the Mobility Task Force the Individual and Business Comity Task Force. The newly named task force continued with tactical charges to facilitate the mobility of professional licenses among member jurisdictions and took a closer look at the issue of business entity mobility and the problems associated with issuance of Certificates of Authorization. A Policy Statement and a Position Statement relative to business entity mobility were developed by the task force and adopted by the Council at the 2002 Annual Meeting. Recommended changes to the *Model Rules and Regulations* and the *Model Law* were forwarded to

the Uniform Procedures and Legislative Guidelines Committee for further consideration. The task force rejected temporary licenses as a means of facilitating comity. The task force developed an instruction sheet and checklist intended to perform two functions: first, to serve as a guide for Member Board Administrators and board members to develop an instruction sheet and checklist to be used in their own jurisdictional application packets; and second, to provide the applicants with a checklist to guide them through the process and to ensure that they have met the intent behind the process. Though much has been accomplished in the area of licensure mobility, the Council continues to consider mobility an important issue, as impediments to mobility still exist.

Fairfield sums up the results of the task forces in the August 2002 edition of *Licensure Exchange*. He writes, "The Council has made great strides recently in becoming more mobilized to handle interstate comity applications. This has to go down as one of the Council's recent success stories, though perfection is still not available in some states."

Council Changes Format of PE Examinations

The NCEES Principles and Practice of Engineering (PE) exams were originally developed and administered with essay problems only. The Council and its psychometricians recognized the value of the all-multiple-choice format for a variety of reasons. Multiple-choice questions can be scored by machine, thus eliminating human input and ensuring a more accurate and bias-free score. As a result, it is less likely that an examinee will successfully challenge an NCEES exam based on uneven scoring. Multiple-choice exams have a shortened turn-around time for exam results and, in general, they lower the cost of scoring, allowing the Council to invest more money in the development of exams. The 100 percent multiple-choice format contributes to testing reliability and consistency of measurement. It has enabled the Council to stabilize exam pass rates and have more control over the degree of difficulty of exams from administration to administration. The Council passed a motion at the 1996 Annual Meeting to make all PE exams, with the exception of Structural I and II, no-choice, all objectively scored. (Eventually, Structural I was slated to become 100 percent multiple choice as well.) In spite of the benefits of this move, transitioning almost 20 PE exams to 100 percent multiple choice was no small undertaking, and it took several years, much planning, and many volunteer hours to achieve.

At the 1995 Annual Meeting, the Council voted to change Group I PE exams (see chart for list of Group I and Group II exams) to the breadth and depth format. This exam format involves testing the breadth of an engineering discipline in the morning section and the depth of the discipline in an examinee's chosen specialty area in the afternoon. In other words, the breadth and depth format allows for measurement of an examinee's minimum competency in the generalities and a chosen specialty area of an engineering discipline. The original goal was to transition all Group I PE exams to this format, but after analysis, exam committees determined that only three PE disciplines had a sufficient number of test takers to statistically support the breadth and depth concept: civil, electrical, and mechanical.

After considerable work by members of the Committee on Examinations for Professional Engineers (EPE), a motion was presented at the 1995 Annual Meeting in Pittsburgh for the Council to adopt the breadth and depth format for PE Group I examinations. The motion passed.

At the 1996 Annual Meeting in Coeur d'Alene, Idaho, the EPE Committee recommended that all engineering examinations be objectively scored. The Committee on Examination Policy and

Procedures (EPP) presented a motion to make that change beginning with the first administration of the breadth and depth examinations. After an amendment that exempted the Structural I and II examinations, the motion passed. In addition, the Steering Committee on New Examination Formats recommended that the body of knowledge in the 1989 task analysis be sorted into the various breadth and depth areas and subsequently used as the basis for new examination specifications. Any additions made by the EPE Committee to the body of knowledge identified by the 1989 task analysis were to be surveyed to determine if they should be added to the examination specifications. The Council also approved a Southern Zone resolution to form a blue ribbon panel in order to review examination specification suitability and to assess attributes common to all disciplines.

At the 1997 Annual Meeting in New Orleans, the Blue Ribbon Panel on Engineering Examinations presented its report after many weeks of meetings and study. Its motions resulted in requirements that a concise definition of breadth and depth be written by the examination committees and Council staff, that the PE examinations be implemented in accordance with that definition, that NCEES implement applicable examinations in the breadth and depth format simultaneously, and that an independent panel of experts from outside the examination process provide a peer review of the total examination process every five years. A white paper that recommended the reorganization of the EPE Committee in order to make it more responsive to PE Group II examination committees, provide better communications with technical societies, and better define the roles of volunteers and Council staff in examination development was included as a part of the EPE Committee report. The EPE Committee also completed development of examination specifications in accordance with the 1996 recommendations of the Steering Committee on New Examination Formats and included those specifications in its written report. The EPP Committee recommended a procedure for updating examination specifications on a continual basis.

At the 1998 Annual Meeting, the EPE Committee included the definitions of both breadth and depth in its written report in accordance with the blue ribbon panel recommendation. Those definitions were jointly developed by the EPE and EPP Committees, reviewed by Council staff, and subsequently became the benchmark for developing breadth and depth examination specifications. EPE also recommended in its report that applicable examinations be permitted to move directly to breadth and depth without the interim step of converting essay questions to multiple choice. The Western Zone report included a resolution that the EPE Committee be directed to move forward with converting applicable engineering examinations to breadth and depth as quickly as possible without expending effort on changing existing examinations to the all multiple-choice format. The resolution also recommended that each Group I examination be converted individually to the breadth and depth format rather than requiring that all examinations be converted at the same examination administration. No vote was taken on the resolution because a Board of Directors resolution that accomplished the same thing preceded it to the floor.

The direction given to the EPE Committee at the 1998 Annual Meeting to proceed with the development of breadth and depth was the starting point of a tremendous effort by the examination committees to convert to the new format. The Civil exam committee was able to proceed without conducting a new Professional Activities and Knowledge Survey (PAKS) and thus was able to make the conversion first. The initial Civil 100 percent multiple-choice, breadth and depth exam was administered in October 2000. The Electrical and Mechanical exam committees benefited from the

Civil committee's learning experience and completed development of their respective examinations shortly thereafter. The Mechanical 100 percent multiple-choice, breadth and depth exam was administered in October 2001, and the Electrical and Computer 100 percent multiple-choice, breadth and depth exam was administered in April 2002.

The following chart shows the history of the various NCEES examinations.

Examinations	Important Dates
Fundamentals of Engineering (FE)	Spring 1965: First offered Fall 1996: Afternoon session changed to discipline-specific format Spring 2002: Added Environmental module in afternoon
Principles and Practice of Engineering (PE) Group I	
Chemical	Fall 1966: First offered
Civil	Fall 1966: First offered Fall 1973–Fall 1982: Sanitary and Structural offered separately Spring 1983: Civil/Sanitary/Structural offered as one exam Spring 1993: Civil/Sanitary/Structural last administered Fall 2000: Changed to 100% multiple-choice, breadth and depth format
Electrical and Computer	Fall 1966: First offered Spring 2002: Changed to 100% multiple-choice, breadth and depth format; name also changed to Electrical and Computer
Environmental	Fall 1993: First offered Fall 1999: Changed to 100% multiple-choice format
Mechanical	Fall 1966: First offered Fall 2001: Changed to 100% multiple-choice, breadth and depth format
Structural I	Fall 1985: First offered Spring 2000: Changed to 100% multiple-choice format
Structural II	Fall 1987: First offered No change to 100% multiple-choice format planned
PE Group II	
Aeronautical/Aerospace	Spring 1978: First offered Fall 1996: Last administration
Agricultural	Fall 1973: First offered Fall 2001: Changed to 100% multiple-choice format
Architectural	Fall 2002: Name changed to Architectural Spring 2003: First offered
Ceramic	Fall 1972: First offered Fall 1991: Last administration

Control Systems	Fall 1992: First offered Fall 1998: Changed to 100% multiple-choice format
Fire Protection	Fall 1981: First offered Fall 1999: Changed to 100% multiple-choice format
Industrial	Spring 1973: First offered Fall 1999: Changed to 100% multiple-choice format
Manufacturing	Fall 1972: First offered Fall 2000: Changed to 100% multiple-choice format Fall 2003: Last administration
Metallurgical	Fall 1980: First offered Fall 2002: Changed to 100% multiple-choice format
Mining/Mineral	Spring 1979: First offered Fall 2002: Changed to 100% multiple-choice format
Nuclear	Fall 1973: First offered Fall 1998: Changed to 100% multiple-choice format
Petroleum	Spring 1973: First offered Fall 1999: Changed to 100% multiple-choice format
Naval Architecture/Marine	Fall 1999: First offered Fall 2000: Not offered Spring 2001: Became a spring exam; name changed to Naval Architecture/Marine
Fundamentals of Land Surveying (FLS)	Spring 1973: First offered Fall 1999: Changed to knowledge-based exam
Principles and Practice of Land Surveying (PLS)	
PLS: One 4-hour exam	Spring 1974: First offered Fall 1992: Last administration
PLS: 3-hour exam, Public Domain	Spring 1986: First offered Fall 1992: Last administration
PLS: 3-hour exam, Colonial	Spring 1987: First offered Fall 1992: Last administration
PLS: 6-hour exam	Fall 1992: First offered

FE Examination and Its Use for Outcomes Assessment

Although the Fundamentals of Engineering (FE) exam was not considered for use as an outcomes assessment tool until 1992, Walt LeFevre, P.E., first began examining the issue in 1984 during his first committee assignment on the FE exam committee. At that time, there was only one FE examination, and it was all general. During a visit to Council headquarters, LeFevre and the committee were given briefings on how the examinations performed and were shown printouts that

listed performance statistics for various groups. At that time, state boards received score rosters and a handful of national printouts that only an educator could love. There wasn't much meaningful data that applied to state examinee performance.

In a conversation at a later meeting, LeFevre inquired of the FE contractor (ACT, Inc., contracted with NCEES to produce the FE exam) if it would be possible to get this performance data by institution for those examinees who took the exam while still enrolled in school. The reply was yes, but it would cost to reprogram the computers and there would be some effort on the part of states to ensure that the answer sheets were properly coded. NCEES would pay to have it done, and the state charge was determined to be $200 per administration. In Arkansas, the board agreed to pay the amount, and NCEES began to get what is known as Report 5. The contractor was amenable to a form that the FE exam committee developed that would give the various engineering programs data that could be used to evaluate their students' performance.

The University of Arkansas Civil Engineering Department used this data to improve the instruction in mechanics of materials, which Report 5 had shown to be a weakness in performance. Changes were made in the presentation of the course materials but not in course content. The instructor was made aware that the students were not performing as well as similar students nationwide. This was a major step in course assessment. Other schools inquired about this assessment procedure due to papers given and published at various American Society for Engineering Education (ASEE) and American Society of Civil Engineers (ASCE) meetings.

In 1992, an NCEES task force with memberships from ABET, Inc., ASEE, the ASEE Deans' Council, and the National Society of Professional Engineers (NSPE) was charged with creating a new FE model that could be used to evaluate minimum competency for licensure and provide data for outcomes assessment for engineering programs. The charge to the committee clearly indicated there was to be a dual use of the exam. The psychometricians were adamant that the exam could not be used for any purpose other than licensure, delaying acceptance of the FE as an outcomes assessment tool. The real problem was those individuals who thought the FE pass rates would be used for outcomes assessment rather than the data provided in Report 5. There are still academic institutions that misuse the FE by analyzing pass-rate data for outcomes assessment. While pass rates may be used to evaluate a total program, they do not yield any curricular information. Performance statistics on topic areas are needed for curricular advice, and they are given in Report 5.

To make the outcomes assessment statistics provided from the results of the FE even more helpful to engineering programs, the 1992 task force saw the need for discipline-specific questions as well as general questions on the exam. In 1995, the Council approved a procedure to add discipline-specific modules to the FE, and in the fall of 1996, the FE exam was administered with a morning portion testing general engineering knowledge and an afternoon portion offering modules, to be selected by examinees, testing discipline-specific areas of knowledge. As of 2003, afternoon modules include Chemical, Civil, Electrical, Environmental, General, Industrial, and Mechanical.

The Council viewed the use of the FE for outcomes assessment as directly in line with the new program evaluation criteria developed by ABET, Inc., called Engineering Criteria (EC) 2000, so called because it would be implemented in the year 2000. This criteria was a change in direction for ABET. It was a definite move away from prescriptive accreditation criteria to more subjective evaluation. EC 2000 requires engineering programs to choose knowledge areas to teach as well as develop means of assessment to determine how well the students retain the body of knowledge. In essence, the ABET evaluation rests on the assessment or measurement of the performance of the

students instead of the performance of the programs. In 1998, the Committee on Examinations for Professional Engineers (EPE) recommended that the Council begin "a grass-roots effort with individual academic programs to convince those who are defining the program evaluation measures that the FE examination is an acceptable tool" for outcomes assessment. Subsequently, the EPE Committee asked a number of educators to write a white paper on how the FE can be used for outcomes assessment. At the 1999 Annual Meeting, the Council approved an EPE motion that NCEES accept for publication the white paper "Using the FE Examination for Curriculum Assessment" and that it be distributed to universities and Member Boards for education about the use of the FE.

In effect, NCEES adopted the posture that the FE can be used to assess performance in certain topic areas and as such be one assessment method of an engineering program. NCEES has stressed that there are many assessment methods available to engineering programs but points out that the FE is the only nationally normed examination available to students who are enrolled in an engineering program. In addition to publishing the white paper, NCEES has encouraged state boards to meet with the engineering faculty of universities in their jurisdictions to network with them and encourage them to use the FE for outcomes assessment. NCEES volunteers have also helped spread the word by speaking at society meetings, universities, and assessment conferences about the value of the FE and how to use it appropriately for assessment. In conjunction with NCEES volunteers, staff has been present at such meetings to distribute literature about the FE and to answer questions about how to use the FE and how to interpret Report 5.

Council Changes FLS to a Knowledge-Based Exam

The Council's move from an experience-based Fundamentals of Land Surveying (FLS) exam to a knowledge-based FLS exam began with the recommendations of the Committee on Professional Activities and Knowledge Study (PAKS)–Land Surveying, appointed by President L. G. "Skip" Lewis, P.E., in 1996. "The 96–98 PAKS–LS Committee was concerned that the experience-based [FLS] exam was allowing surveyors to enter the profession with an inadequate knowledge of some portions of surveying theory, most notably geodesy as it applies to the use of a GPS surveying tool," comments Ralph W. Goodson, P.E., L.S., a member of the PAKS Committee. He continues, "This concern led the committee to propose a [PAK] survey that based the FLS portion of the PAKS on academic knowledges." At the 1997 Annual Meeting, the Council approved the move to a knowledge-based FLS exam.

The PAKS–LS Committee held meetings from 1996 to 1998 to plan, implement, and compile the results of the survey. Engineering and surveying are ever-changing professions, and in recognition of this, NCEES psychometricians recommend that the Council perform a PAKS for each examination every five to seven years to determine the examination's content and scope. The PAKS is a survey sent out to licensed practitioners across the United States. It lists a variety of competencies (knowledge, skills, and activities) and asks the respondents to indicate the importance of each for an entry-level or experienced professional. In 1998, the PAKS–LS Committee completed the land surveying PAKS. With a response rate of 38 percent (considered high by psychometricians), committee members felt confident that the PAKS results were valid and that "[survey] respondents represent[ed] professional land surveyors across the nation." (*PAKS for Professional Surveying Final Report*, 1998)

The Committee on Examinations for Professional Surveyors developed the October 1999 examination and subsequent examinations to fit the knowledge-based competencies reflected in

the survey. This historic move from a practice-based to a knowledge-based FLS exam reflected the profound changes that had occurred in the profession over the last 30 years, as well as the evolving responsibilities of surveyors. Goodson says, "Prior to [October 1999], the profession of surveying had been considered 'apprentice based,' that is, requiring no formal education. Potential surveyors came to the profession through experience, not by pursuing a course of study in college." With a larger number of exam candidates being graduates of a four-year course of study in surveying and mapping, it became clear to many of those involved in developing the LS exams that testing on an experience basis was not adequate. The move to a knowledge-based FLS, first administered in October 1999, was also consistent with the definition of Model Law Surveyor approved at the 1995 Annual Meeting. Under the new definition, a Model Law Surveyor must be a graduate of an EAC/ABET-accredited engineering curriculum, an ASAC/ABET-accredited curriculum, or the equivalent.

Feasibility of CBT Researched

Computer-based testing (CBT) was first discussed by the Committee on Examination Policy and Procedures (EPP) in 1996–1997. Further comment and study were made in subsequent years by the EPP Committee, the Blue Ribbon Panel, and the Computer-Based Testing Task Force.

In 1999, the CBT Task Force proposed two motions to the Council. The first motion proposed that the Council affirm the vision that CBT was the direction the Council should adopt and begin moving toward. The second motion was the proposal of a Stage I effort toward implementation: conduct a feasibility study and provide a recommendation on the potential for a beta test of the Fundamentals of Engineering (FE) and Fundamentals of Land Surveying (FLS) exams. The second motion shifted responsibility for further research and study from the task force to Council staff, who would then report their findings and recommendations to a volunteer oversight group. The Council approved both motions.

The 2000–2001 CBT Oversight Group was then tasked to "Review the staff analysis of the research data and recommend to the Council whether or not to proceed with the beta test for computer-based examinations."

Council staff conducted research from January to December 2000 in support of the project objectives developed by the CBT Task Force. Research was conducted to gather data on the thoughts, attitudes, and perceptions about CBT held by stakeholders within NCEES, members of engineering academia and organizations, engineers, and engineering students and interns.

Stakeholders within NCEES—Council representatives (via phone interviews), Member Board Administrators (via phone interviews and written surveys), and members of Member Boards (via written survey)—had the following opinions about the use of CBT.

Perceived advantages of CBT

- Scoring and receipt of results would be accelerated.
- Administrative work for Member Board Assemblies would decrease.
- Exam security would be enhanced.
- Exams could be offered more frequently.

Concerns about CBT

- Rising candidate fees would cause a decrease in the number of exam takers.
- Legislative fee caps would be cumbersome to change.
- Exam item banks might be inadequate.
- Security could be at greater risk because of increased exposure of the exam.

Engineers and engineering students (secondary research) and engineering students and engineer interns (via focus groups, phone interviews, student intercepts, and written surveys) had the following opinions about the use of CBT.

- Paper/pencil testing is strongly preferred over testing via a computer.
- Diagnostic sample tests are the most preferred materials for exam preparation.
- They believe CBT will provide quicker scoring and results.
- They believe the real benefits of CBT are for test administrators.
- The length of screen time required is a concern if the current FE exam format is maintained.
- They believe if licensure has value, delivery of examination via CBT will not deter takers.
- Though students reported extensive use of computers, they currently have little to no exposure to computer-based testing (as envisioned by NCEES) during their engineering degree programs.

A comprehensive analysis by staff of all the data indicate that the key stakeholders are not ready for CBT and there is much to do before CBT can be implemented. Therefore, proceeding with a beta/pilot test would be premature until the Council resolves issues such as item development, the potential change to modular exams, the value of licensure to stakeholders, Member Board concerns, and candidate acceptance of CBT.

Because of the significant breadth of this research project, many issues, both related and unrelated to CBT, surfaced, particularly in regard to career selection and the value of licensure.

Members of engineering academia (via phone interviews) and members of engineering organizations (via phone interviews) had the following opinions.

- Licensure needs to redefine itself according to current perceptions of relevance.
- Licensure needs to redefine itself in order to anticipate changes in global practice.
- Potential licensees have little motivation to become licensed because they see little value in having a license.

Engineers and engineering students (secondary research) and engineering students and engineer interns (via focus groups, phone interviews, student intercepts, and written surveys) had the following opinions.

- Market demand for engineers is currently very high.
- The declining trend in engineering BS degrees likely will reverse.
- A shift from a manufacturing-based to an information-centered engineering workplace is affecting the type of careers engineers pursue.
- They consider themselves "professionals" upon completion of their degree program, creating confusion in the marketplace about the value of being a professional engineer.
- Mentoring programs are lacking despite significant interest in licensure from young engineers in all disciplines.
- They believe licensure lacks immediate and tangible benefits.
- Knowledge about the licensure process is lacking in most disciplines except civil.
- Encouragement of licensure from academia is essentially nonexistent.
- Engineering students get most of their information about licensure from upperclassmen.
- Those who choose the licensure path do so as "career insurance" to measure and/or to maximize opportunities.

As a result of its findings, the CBT Oversight Group suggested the following recommendations for dealing with these issues.

Licensure Promotion

- Develop programs to show how licensure is relevant to engineers, particularly for those practicing outside the civil discipline.
- Develop a formalized outreach plan for schools to use in introducing the FE exam to students in the mechanical, electrical, and chemical disciplines.
- Communicate the importance of licensure to key employers of engineers.
- Develop a marketing plan to coordinate educational and promotional efforts and public service announcements.
- Form a coalition to increase national and international promotion and endorsement of P.E. licensure in jurisdictions.
- Develop a speaker's bureau to promote professional engineering and provide a Speaker's Kit and formal presentation for P.E. recruits to speak at universities to encourage the use of FE/PE.
- Link the update of all exam job analyses to marketing and public service announcements featuring the "top 10" expectations for P.E. employers and the public.

Examinations

- Consider modularizing the exams for greater flexibility in delivery.
- Increase pace of the development of items (i.e., 500/yr. for FE. Other examinations will also have to experience increased growth).
- Pretest items to begin building the bank with items and associated Item Response Theory (IRT) data.
- Restructure the item types (limiting the number of graphics).
- Evaluate the market for new exams based on changing engineering practice (project management/business skills/computer engineering), engaging possible partnerships to provide NCEES-specific expertise.

The CBT Oversight Group made the following motions at the 2001 Annual Meeting.

- Move that the CBT beta test *not* be performed at this time and that the Council affirm its vision to pursue CBT as a viable delivery mechanism for its exams. This vision includes, but is not limited to, a focus on outreach, a continuing focus on item development, monitoring trends in the CBT field, communicating testing changes to the stakeholders as appropriate, and obtaining relevant feedback from potential licensees. In addition, a long-term plan to move the CBT process forward should be developed.
- Move that the appropriate entities develop a long-term strategic plan to support and enhance the value of licensure to all stakeholders.
- Move that the Council support in concept the "additional opportunities" outlined in the Committee's report and that the President-Elect charge appropriate committees to explore these opportunities in support of strategic planning activities.

The motions passed with no discussion.

Model Law for Surveying Revised

In 1994, President Leon Clary, P.E., L.S., charged the Committee on Uniform Procedures and Guidelines (UPLG) with responding to the following request from the surveying community:

"Consider expanding the definition for the practice of land surveying…to include reference to the surveyors' contribution to Geographic and Land Information Systems and geodetic surveying." In its 1995 report, the UPLG Committee presented an updated definition with the following rationale: "The existing definition of the practice of land surveying is a very narrow and outdated one. It does not recognize the expanding current practice of surveyors. Neither does it recognize that most states either already have or are working toward a four-year degree requirement for surveyors. With the evolution of technology, practice, knowledge, credentials, and more diverse practice of surveyors, the definition is due for a complete overhaul." Delegates to the 1995 Annual Meeting approved the updated definition for inclusion in the *Model Law*. The definition included the broad range of activities that was then being performed by surveyors and that was already regulated by a significant number of states. Photogrammetry and those activities concerning land boundaries in Geographic Information Systems (GIS) were included in the definition.

As a result of this revision to the *Model Law*, the Management Association for Private Photogrammetric Surveyors (MAPPS), the American Society for Photogrammetry and Remote Sensing (ASPRS), and the geomatics division of the American Society of Civil Engineers (ASCE) sent letters of concern to NCEES. These organizations felt that their members were being drawn into the licensing process—that is, being required to be licensed to practice—without due process or recognition of their experience. In the spring of 1997, the American Congress on Surveying and Mapping (ACSM), the National Society of Professional Surveyors (NSPS), MAPPS, ASPRS, and ASCE formed a task force to address their concerns about the *Model Law* definition of the practice of surveying. This task force, officially named the Task Force on the NCEES *Model Law* for Surveying but commonly referred to as the Multiorganizational Task Force, was facilitated by Jim Plasker, P.E., executive director of ASPRS. It met weekly for two-hour conference calls and thoroughly reviewed the *Model Law* for surveying.

The UPLG Committee studied the 1997 report of the Multiorganizational Task Force and its recommendations. Members of UPLG did not support the task force's recommendation that surveying licensure be divided into two tiers: one for boundary surveyors and one for nonboundary surveyors. However, members incorporated many of the task force's recommendations into motions placed before the Council for approval. As a result, between 1997 and 2000 NCEES made several changes to the *Model Law* for Surveying, including the following:

- Added a provision for "grandfathering" into licensure those surveyors with long experience and demonstration of responsible charge
- Reordered the activities included in the definition of surveying so that boundary and nonboundary survey activities were separated into groups
- Added a provision to the *Model Law* allowing jurisdictions to waive the state-specific exam for nonboundary practice if the jurisdictions so desire
- Added a provision stating that practicing outside one's area of competence would be subject to discipline
- Modified Exam Policy (EP) 12, which provides for depth modules to be developed for the Principles and Practice of Land Surveying (PLS) exam when at least 10 jurisdictions demonstrate need under their law

In October 2000, the Multiorganizational Task Force, joined by representatives from the National States Geographic Information Council (NSGIC) and the Urban and Regional Information Systems Association (URISA) presented a GIS/LIS Addendum to its original

report. The introduction to the addendum refers to the original task force report, saying, "That report was specifically limited to the photogrammetric issues and purposefully set aside the GIS/LIS issues until a broader coalition of partner organizations could participate in addressing the concerns….[M]any of the 1997 task force report recommendations concerning photogrammetric practice have been satisfactorily acted upon by NCEES and for that the task force is grateful." The addendum's recommendations included sharpening the *Model Law* language to avoid ambiguity and stating clearly which activities should be included in the purview of surveying licensure and which should be excluded.

In response to developments in the North American Free Trade Agreement (NAFTA) negotiations and concern among state surveying societies, NSPS requested the Council to further consider the Multiorganizational Task Force original report and addendum. In 2000, President J. Richard Cottingham, P.E., P.L.S., appointed the NCEES Task Force on *Model Law* for Surveying (TFMLS) to address such concerns. President Ted Fairfield, P.E., elected in 2001, continued the work of this group.

Cottingham and Fairfield gave several charges to TFMLS, but in essence, the members were charged to do an in-depth study of the definition of surveying. This included studying what activities should be included in the definition of surveying practice and developing a licensing model that would be the best course for the future. In addition to reviewing closely the Multiorganizational Task Force report and addendum, TFMLS looked at the International Federation of Surveyors (FIG) definition of surveying, which is accepted by many of the world's nations, and the terms of the proposed Mutual Recognition Document (MRD) being negotiated by NSPS with the Canadian and Mexican surveying organizations. The task force also surveyed graduates of two-year and four-year surveying/geomatics programs about their career paths. Members discussed the needs of those states that license surveyors to do drainage and "minor engineering."

After long discussion, the task force decided that the surveying licensure model as outlined in the 1995 revision of the *Model Law* is the correct course for the future. The Multiorganizational Task Force originally recommended a tiered approach to licensing that was broadly debated. NCEES did not adopt that model, and the task force did not recommend it. The *Model Law*, as revised in 1995, offered two choices of names for surveyors: professional surveyor and professional land surveyor. Many misunderstood this and believed that two classes of surveyors were proposed. The task force recommended the use of only one title throughout the *Model Law*. It chose the term "professional surveyor," but offered other choices as alternatives in the section. The task force asserted that whatever title is chosen by a jurisdiction should be used for all those who practice within the definition of surveying. The qualifications for licensure for any subdisciplines of surveying should be the same for all and should be consistent with the current NCEES *Model Law* requirements. Task force members anticipated that the need may arise to develop exam modules for specialty areas within the practice of land surveying. When the requirements of EP 12 are satisfied, these exam modules should be incorporated into a breadth/depth PLS exam in the same manner as breadth/depth modules in the Civil, Electrical and Computer, and Mechanical Principles and Practice of Engineering (PE) exams.

Members of the task force agreed that knowledge of measurement science is the foundation of all surveying, no matter what specialty one might practice. They felt that the current *Model Law* path toward licensure should apply to all, including those whose jurisdiction exempts them from the state-specific exam because they practice in a nonboundary area. To become a professional surveyor,

or whatever title is elected, ideally one must complete a four-year degree, successfully pass the FLS exam, gain four years of progressive experience under a licensed professional, and pass the PLS exam. The extent and nature of the state-specific exam is left to the discretion of the individual jurisdiction. The task force discussed the possibility of lengthening the national examination to eight hours. No recommendation was made in the final report.

One of the charges President Fairfield gave the task force was to determine whether photogrammetry should be included within the definition of survey practice. There was unanimous consent that it should be, for a number of reasons. Aerial surveys determine the contours and features of land, practices already regulated by many jurisdictions. Once the data is collected, the process of generating contours, and the hardware and software used, are virtually the same, whether done aerially or on the ground. No matter how topographic maps are generated, the National Map Accuracy Standards apply equally. The task force believed strongly that equal qualifications and accountability are required. The tools used to produce the product may be different, but the outcome is virtually the same. Photogrammetry must be included in the definition for the protection of the public.

NCEES recognized that provisions for absorbing existing practitioners must be made when first including a new activity within the definition of practice. In 2000, the *Model Law* was expanded to include a section entitled "Savings Clause," commonly called grandfathering. If one can demonstrate long practice in that activity, with a certain number of years in responsible charge, it is not defensible to bar them from practicing that profession. Typically, the window for becoming licensed in that way is not more than one year from the time the law is expanded. After careful review of the *Model Law* and discussion, the task force felt that no further action was necessary in the area of grandfathering.

At the end of its extensive deliberations, TFMLS affirmed the concept of one license and one title for all surveyors. The task force supported the licensure model identified in the revised 1995 *Model Law* as well as a future breadth/depth PLS exam, provided the requirements of EP 12 are met. In addition to its affirmation of the revised 1995 *Model Law*, the task force presented proposed changes that were carefully crafted to convey a clear and exact definition of the practice of surveying. Included in those changes were "Inclusions and Exclusions" presented by the Multiorganizational Task Force addendum. This list, modified by TFMLS, clarified what parts of GIS/LIS are subject to regulation. At the 2002 Annual Meeting, the TFMLS presented its final report. The Council affirmed its recommendations by voting to submit them to the UPLG Committee for implementation into the *Model Law*.

At the 2003 Annual Meeting, the UPLG Committee submitted revisions to the *Model Law*—TFMLS recommendations—to the NCEES delegate body. The suggested revisions to the *Model Law* and *Model Rules* were adopted with one motion for change. A motion from the floor was approved that removed all of the language in the *Model Law* that provided a waiver of the state-specific examination for those surveyors and mappers who practice in the nonboundary area of the profession.

ELQTF Studies Engineering Licensure Process

In late 2000, President J. Richard Cottingham, P.E., P.L.S., tasked the Engineering Licensure Qualifications Task Force (ELQTF) with considering the engineering licensure system and developing recommendations for possible changes or enhancements. ELQTF was a multiorganizational group that included representatives from NCEES and 11 engineering societies.

These representatives displayed a cross section of the engineering profession in terms of geography, discipline, and practice: American Academy of Environmental Engineers (AAEE); ABET, Inc.; American Council of Engineering Companies (ACEC); American Society for Engineering Education (ASEE); American Society of Civil Engineers (ASCE); American Society of Mechanical Engineers (ASME); Institute of Electrical and Electronics Engineers–USA (IEEE–USA); National Society of Professional Engineers (NSPE), Engineering Deans Council, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), and Canadian Engineering Qualifications Board (CEQB).

The face of the engineering profession was changing rapidly and would continue to do so—ELQTF sought to establish a clear picture of the current licensure system as viewed by its stakeholders. It also sought to establish the direction licensure should take in the future, again reflecting its many stakeholders. NCEES did not take a position on any of the issues associated with ELQTF's work and served only as the facilitator of the process.

ELQTF spent most of 2000–2001 gathering information and discussing the issue of licensure from a variety of perspectives. Concerns with the current system were identified, and concepts and ideas were developed for presentation. During 2001–2002 this information was presented at the Board Presidents' Assembly, zone meetings, and the Annual Meeting. At each meeting, questionnaires were distributed to allow NCEES members to express their thoughts and preferences on both the ELQTF process and the subject of licensure. Several of the other engineering societies participating on the task force did the same with their members and shared their feedback with the task force. In 2002–2003, the task force deliberated the issues and developed recommendations. Many recommendations had unanimous support, and the rest had a clear consensus. Due to the consensus, no alternative positions were established on any of the issues or recommendations. In late 2002, President Krebs formed the Licensure Qualifications Oversight Group (LQOG) to study the ELQTF report, assess the recommendations from the NCEES and Member Board perspectives, and prepare recommendations for consideration by NCEES. LQOG was the next step in the process of a thorough review of the licensure system.

ELQTF agreed that the licensure process should be more applicable or desirable for engineers in industry or government or those otherwise offering services indirectly to the public. It should also reduce the undesirable effects of the industry exemption and should adopt more appropriate titles for engineers who are appropriately educated.

Some of the task force recommendations included that a waiver of the FE examination be allowed in the *Model Law* for those who possess an EAC/ABET-accredited degree and a Ph.D. or doctorate in engineering, that candidates be allowed to take the Principles and Practice of Engineering (PE) examination, in its present technical format, anytime after they graduate with an EAC/ABET degree, and that an applicant for licensure as a professional engineer be required to pass a nontechnical professional practice examination after satisfying all other requirements. It also recommended adopting a tiered system of licensure. A majority, but not all, of the members of the task force believed that such a system may appeal to more engineers in industry and government than does the current system. In keeping with the tiered system of licensure, the task force recommended that the titles associated with the practice of engineering be modified to Graduate Engineer, Associate Engineer, Registered Engineer, and Professional Engineer.

In March 2003, the Council published the ELQTF findings in an 87-page document entitled "Report of the Engineering Licensure Qualifications Task Force," which was distributed to members of

Member Boards. Sections 7 and 8 of the ELQTF report summarize the issues discussed and corresponding recommendations. Section 9 summarizes the "Consensus Licensure Model" that exhibits many of the recommendations. Section 10 discusses implementation issues, and the remaining sections of the report are dedicated to background information. At the following 2003 Annual Meeting, ELQTF presented its report to the Council delegate body and moved that the "President consider charging the Licensure Qualifications Oversight Group [LQOG] with researching the conclusions and recommendations contained in the ELQTF report and preparing appropriate recommendations for NCEES consideration." The Council approved this motion.

ELSES, LLC, Exam Administration Service Created

ELSES, LLC, the NCEES-sponsored exam administration service, began at the request of the Arizona State Board of Technical Registration. The Arizona Board asked NCEES to participate in a pilot study assisting with its upcoming exams. After consideration and approval by the NCEES Board of Directors, the Council handled usual aspects of the April 2000 administration, including locating the site, hiring the proctors, collecting registration information and candidate fees, and administering the exams. The pilot program was a success, and the Arizona Board and NCEES agreed to continue the arrangement. Since that time, the Council's exam administration service has grown exponentially. As of October 2003, ELSES had administered exams for 18 Member Boards.

With the success of the Arizona pilot study, the Council offered exam administration services to all Member Boards and created a division to perform this service, naming it Engineering and Land Surveying Examination Services (ELSES). The Louisiana Professional Engineering and Land Surveying Board contracted with ELSES to administer its exams for April 2001, giving the Council the responsibility of two jurisdictions. In October 2001, ELSES provided services for three boards, while the number of jurisdictions requesting exam administration continued to grow.

With each new jurisdiction joining the ELSES fold came thousands of exam candidates asking questions, registering, paying fees, and expecting to have seats and chairs, knowledgeable proctors, and a comfortable site on exam day. In addition, the Council became responsible for the security of thousands of exam books, shipped to and from exam sites. With each new jurisdiction, the responsibilities and liabilities of ELSES grew.

Beginning in late 2002, the NCEES Board of Directors recognized the need for the legal status of ELSES to change and the need to segregate the liabilities associated with the exam administration function being performed by NCEES through ELSES. Several alternatives were considered, but the Board determined that the creation of a single-member limited liability company (LLC) was the most advantageous.

As the name implies, the owners of a limited liability company are not generally responsible for the debts or obligations of the LLC. A corporation is another type of entity in which the owners are not responsible for the entity's obligations. However, the LLC offers the opportunity to elect how the entity will be treated for federal income tax purposes, while a corporation does not. Conceptually, the owners of an LLC are referred to as the "members." An LLC can be managed by one or more managers or by the members. The rights and responsibilities of the members (and managers if any) are set forth in a document referred to as the Operating Agreement.

ELSES, LLC, was created under South Carolina law as a member-managed LLC with only one member, NCEES. The Council advanced working capital to ELSES to fund its initial operations and cover risk contingencies until reserves were built. Employees of NCEES perform services for

ELSES pursuant to a written agreement, and proctors are paid by ELSES. As the sole member, NCEES has the right to manage the operations of ELSES. Under the Operating Agreement, the NCEES President-Elect, Executive Director, Associate Executive Director, and Director of Finance serve as the Board Representative Officers and are delegated the responsibility of managing the affairs of ELSES. Regular operating and reporting guidelines are set forth in the Operating Agreement. NCEES reserves the right at any time to change or remove any of the officers of ELSES. Under South Carolina law, ELSES is treated as an "affiliate" of NCEES and is therefore tax exempt and is not required to obtain a separate tax-exempt determination from the IRS. At this writing, ELSES is filing for authority to do business in all states in which it provides services. Most states follow the same tax treatment as South Carolina; however, some may have fees or taxes that apply regardless of the tax classification by that state.

The creation of ELSES has provided an approach for the exam administration responsibilities and liabilities to be segregated from NCEES. NCEES has retained the management authority for the ELSES operations. ELSES is not required to obtain a separate determination of tax exemption with the IRS and, except for certain state and payroll filings, ELSES is not required to separately file with tax authorities. This serves to minimize overall administrative costs of the program.

In only a few short years, ELSES became a significant part of the services the Council provides to its Member Boards. In addition to developing engineering and surveying licensing exams, the Council now administers those exams through its affiliate ELSES. Because of its close association with the Council, ELSES recognizes the importance of administering the exams in accordance with NCEES policies and procedures. The legal status of ELSES allows the Council to provide this administration service while limiting liabilities to ELSES alone.

Council Approves Plan for Licensure Promotion

In 2000–2001, the Council performed extensive research to aid in evaluating computer-based testing (CBT). This research included many focus groups with university engineering students. In addition to answering questions about taking tests via computers, the students responded to questions about the Fundamentals of Engineering (FE) exam, licensure, and the title Professional Engineer. The results prompted Council members to consider how engineering students—and their professors—could be educated about licensure and its benefits.

President J. Richard Cottingham, P.E., P.L.S., appointed the Licensure Promotion Task Force for the 2000–2001 fiscal year, and President Ted C. Fairfield, P.E., continued the task force into 2001–2002. The task force spent its first year investigating the following questions: What is the perceived value of engineering licensure to engineering students, graduate engineers, engineering educators, and other stakeholders? What promotional efforts are in place to positively impact the perception of engineering licensure?

The task force found that there was little recognition of the value of licensure among stakeholders. Research data indicated that engineering students lacked an understanding of licensure, its importance, and the qualifications required to become licensed. In focus groups, students were confused about the title Professional Engineer and what it signifies. Most students thought they would be professional engineers if they performed well in their careers after graduation. Research data showed that students had limited exposure to the process of licensure, including the FE or Principles and Practice of Engineering (PE) examinations. This fact was reinforced when as many as 30 percent of students surveyed indicated they had not heard of the FE examination.

Next, the task force began a thorough evaluation of current licensure promotional materials available through NCEES and professional and technical societies, as well as the promotional efforts being implemented. The task force explored what additional materials and activities were needed to promote the use of the FE for outcomes assessment, to encourage students to take the FE in their senior year, and to increase the percentage of engineering graduates pursuing licensure. Once appropriate materials and activities were identified, the task force determined effective avenues of implementation. From these discussions, task force members reached consensus on a long-term plan of action in March 2002 and submitted it to the NCEES Board of Directors for adoption in May 2002. The Council approved the plan at the 2002 Annual Meeting. This plan called upon the active support of Member Boards, volunteers, and coalitions of technical and professional societies for its success.

In support of the task force's long-term plan, the Council moved forward in its commitment to the protection of the public and promotion of licensure. A variety of NCEES licensure promotion efforts are described below.

- In early 2003, the Council launched a new Web site, www.engineeringlicense.com, geared specifically to engineering students and interns. The site has a "look" designed to appeal to young adults and contains all the information one needs to understand the path to licensure and its benefits. Viewers can click on FE Exam or PE Exam as well as What to expect and Test scoring. There is also a Career Profiles section where viewers can read about several licensed engineers and an engineer intern, their current jobs, and why they decided to pursue licensure. The Web site is a perfect complement to the Speaker's Kit.
- The Council debuted its new Speaker's Kit in early 2003. Designed to aid representatives of Member Boards in sharing the licensure message, the kit contains an eye-catching pamphlet, video, and PowerPoint presentation with accompanying script. Used in part or in its entirety, the Speaker's Kit is an excellent tool for those who wish to speak about licensure at university campuses or to student organizations, classes, or gatherings. The Council has distributed kits to all of its engineering Member Boards. Kits are also available upon request from NCEES headquarters.
- In connection with the Speaker's Kit, the Council continues to recruit licensed professionals to speak at their local university campuses. These volunteers form a speaker's bureau from which the Council's outreach coordinator can draw when a student organization or engineering group requests a licensure presentation.
- The Council has sponsored or been a contributor to many annual meetings of student engineering organizations since 2001. At the meetings, NCEES representatives participate in "expo" opportunities to distribute literature and, more importantly, to make contacts with engineering students. NCEES representatives also provide workshops on the path to licensure and its benefits. The workshops provide a time for interested students to hear more about the licensure track and ask questions. At a meeting in 2002, NCEES had the opportunity to supply the Farewell Banquet Keynote Speaker. At the end of Professional Engineer Bill Sutherland's speech on licensure and professionalism, the audience of over 300 students gave him a standing ovation.
- NCEES continues to promote the FE as an outcomes assessment tool by seeking opportunities to network and speak at meetings of the American Association of

Engineering Educators, the Engineering Deans' Council, and meetings of engineering professional and technical organizations. Fortunately, many NCEES volunteers are willing to represent the Council at these meetings, using their personal contacts to informally share why they use the FE for outcomes assessment at their own universities. NCEES also makes presentations about the benefits of using the FE for outcomes assessment and how to use it appropriately.

- Each spring and fall, NCEES conducts a poster campaign on 59 university campuses, advertising the FE exam and its position as the first step on the path to licensure. These 59 institutions have the largest engineering student populations in the United States, so NCEES is able to target as many engineering students as possible with the licensure message.

After two years of research analysis and discussion, The Licensure Promotion Task Force developed a long-term plan to increase the percentage of engineering students taking the FE examination and embarking on the licensure track. The task force presented its plan at the 2002 Annual Meeting, and the Council approved it. The plan is in concert with the mission of NCEES and is designed to advance public health, safety, and welfare through increased education and awareness of the benefits of licensure, its process, and the protection of the public resulting from licensed professionals. NCEES continues to be committed to the value-of-licensure message and the activities supporting it and encourages all stakeholders to share in this commitment.

Council Supports Digital Signature Technology

In 1998, President Steven Schenk, P.E., established the Electronic Technology Task Force to study and develop model regulatory standards for the use of secure electronic technology in the practice of engineering and surveying. He also charged the task force with writing a white paper on its deliberations in developing these standards. The task force submitted its report and white paper in 2000, moving that the Council include in its *Model Law* a set of regulatory standards that follow the federal guidelines for digital signature technology. The Council approved this motion. Interestingly, the week that the task force presented the standards to the Council at its 2000 Annual Meeting in Chicago, U.S. President Bill Clinton made history by being the first president to sign a Congressional bill electronically.

The standards that the Council adopted into the *Model Law* set forth that a digital signature may be used in lieu of the traditional hard-copy signature and seal, thus allowing for electronic transmittal of engineering and surveying documents without having to produce a hard-copy set. As stated in the *Model Law*, Section 2, Definitions, at a minimum, the digital signature must be an "electronic authentication process attached to or logically associated with an electronic document. The digital signature must be unique to the person using it, capable of verification, under the sole control of the person using it, and linked to the document in such a manner that the digital signature is invalidated if any data in the document is changed." NCEES later moved this definition to the *Model Rules*, 240.20, C.8, Seal on Documents.

The Electronic Technology Task Force white paper looked at the important issue of how the public and the profession would be affected by the application of digital technology to the traditional acts of signing and sealing documents. It examined the issue from both the legal and practical viewpoints and identified a position that benefits both the public and the licensed design professional. The task force found that the use of digital signatures could adequately protect the public and recommended that electronic technology be encouraged in an open and unrestricted

environment to further protect the public from the current common practice of delivering documents electronically with no security or protection.

Council Reaches Out to International Engineering Societies through USCIEP

The United States Council for International Engineering Practice (USCIEP) is the main forum through which NCEES monitors and participates in global organizations concerned with regulating and facilitating engineering practice. The purpose of USCIEP, as defined in its constitution and bylaws, is to represent its members in developing, negotiating, and promoting qualifications and procedures to enable professional engineers to practice internationally. Its members are NCEES, ABET, Inc., and the National Society for Professional Engineers (NSPE).

In January 1989, NCEES, ABET, Inc., and NSPE formed the Council for International Engineering Practice (CIEP) to work with Canadian and Mexican representatives to negotiate the North American Free Trade Agreement (NAFTA) Mutual Recognition Document (MRD) for engineering services. In 1991, CIEP changed its name to USCIEP. In 1994, USCIEP was recognized by the Office of the U.S. Trade Representative (USTR) as a relevant professional body to represent the interests of U.S. professional engineers in the NAFTA discussions.

At its 1995 Annual Meeting, NCEES ratified the NAFTA-MRD for a two-year period only, with the understanding that negotiations would continue on examinations, experience, and education. Specifically, the Council instructed NCEES negotiators for USCIEP that permanent ratification of the MRD would be contingent upon including a provision that host jurisdictions require examination in a manner consistent with that jurisdiction's examination requirements for licensure by comity within the United States.

Despite reservations expressed by other states, the Texas State Board of Registration for Professional Engineers signed a Letter of Intent on November 18, 1996, to begin the process of implementing the provisions of the NAFTA-MRD. In the letter, Texas states, "The Board intends to deliberately identify and pursue courses of action, consistent with the Document and with the licensing standards of the Texas engineering profession, that can serve to improve the mobility of professional engineers across the borders of Texas and throughout North America."

Two interim meetings of representatives from Canada, Mexico, and the United States took place in 1996 and 1997. At these meetings, USCIEP clearly stated its intention to propose revisions—regarding examinations, among others—to the NAFTA-MRD at the next formal NAFTA Forum in October 1997. While Canada and Mexico said they would be open to further discussions, they were not interested in entertaining proposed revisions before the NAFTA-MRD was ratified permanently by all parties. Canada said it would continue to work with Mexico, Texas, and other U.S. states that wished to pursue implementation within the framework of the current MRD. Mexico said that it believed the NAFTA-MRD to be a valid document and could not halt the implementation because the Mexican government had already acted upon the MRD. In keeping with the schedule to meet every two years, the next NAFTA Forum was tentatively set for 1999 in Mexico.

From 1997 to 1999, USCIEP remained in contact with Canada and Mexico and periodically apprised the Office of the USTR about the MRD's status. A NAFTA Working Party meeting was held in September 1998 to discuss each country's progress regarding implementation of the NAFTA-MRD, but the NAFTA Forum scheduled for 1999 did not materialize. At this writing, USCIEP's efforts to organize another forum have been unsuccessful. In 2000, USCIEP invited Canada and

Mexico to attend a NAFTA Forum in Lake Tahoe, Nevada, October 2001. However, Canada and Mexico declined, stating, "Rather than a NAFTA Forum, CCPE believes a meeting with those parties who have already agreed to implement the NAFTA-MRD, i.e., Canada, Mexico, and Texas, to discuss implementation issues would be more beneficial at this time. Representatives from USCIEP would be welcome to attend this meeting."

While USCIEP has not been successful in its efforts to reconvene the NAFTA negotiating parties, discussions between Texas, Canada, and Mexico have progressed significantly. Subsequent negotiations between Texas, the Canadian Council of Professional Engineers (CCPE), and COMPII (Comité Mexicano para la Práctica Internacional de la Ingeniería) culminated in the development of a draft document entitled "NAFTA Mutual Recognition Agreement Operational Procedures Document (OPD) based on the NAFTA-MRD Articles," which was completed at a meeting in Ottawa in September 2002. The purpose of the document is to provide the operational policies and procedures to implement the NAFTA-MRD in the three jurisdictions. According to Section 1.2 of the document, it is intended to serve as the

> controlling document with respect to standards, criteria, policies, procedures and measures for jurisdictions implementing and operating under the NAFTA-MRD. In the absence of any reference or specification in the OPD [Operational Procedures Document], provisions in the host jurisdiction shall prevail. In the absence of any reference or specification in the OPD or host jurisdiction, the MRD shall prevail.

At the invitation of CCPE, USCIEP Chair Dale Sall, P.E., L.S., (NCEES Past President 1999–2000) attended the Ottawa meeting. CCPE invited USCIEP to review the OPD to determine if this document described an approach in which USCIEP might be interested. Canada also asked if NCEES would consider proposing the OPD to Member Boards to determine if other states would be interested in participating. USCIEP evaluated the document in 2003 and identified several concerns, which it expressed to representatives of the Texas Board in a letter in July 2003. USCIEP issued a news release to explain its position on the OPD. While USCIEP recognized the significance of the OPD and applauded the progress Texas had made, USCIEP could not endorse the OPD because it allowed significant departures from the NCEES *Model Law*. Further, USCIEP stated that while it believed Texas was appropriately recognized as having the role of a Representative Engineering Organization (REO) for the limited purpose of the OPD, USCIEP was and would remain the REO of the NAFTA-MRD. USCIEP stated in its letter to Texas that it "recognizes that the NAFTA-MRD has implications that reach far beyond the jurisdiction of one or a few states and insists upon preserving the role of USCIEP in addressing and approving any proposed changes to the parent document." Consequently, USCIEP advised Texas that it expected to be notified of and involved in any efforts to modify the NAFTA-MRD.

Unsuccessful attempts to have NCEES unconditionally ratify the NAFTA-MRD and the subsequent stalemate in negotiations with Canada and Mexico in 1997 indicated that USCIEP needed to negotiate, communicate, and govern itself more effectively. Improved governance and clearer direction were needed to resolve not only the issues surrounding NAFTA, but also to evaluate and respond to other multinational organizations such as the Asia-Pacific Economic Cooperation (APEC) Human Resources Development Working Group that invited USCIEP to participate on a regular basis in discussions concerning the regulation and mobility of engineering practice.

Debate among members regarding restructuring USCIEP threatened to dismantle the organization. While dissolution was a seriously considered alternative, members decided that preserving the organization would best serve their constituencies and the engineering community. They agreed that there is a need for an entity such as USCIEP to monitor international activities, inform Member Boards about foreign licensure systems and developments, and provide a unified voice for the U.S. engineering community in international groups.

In 2000, USCIEP adopted a new constitution and bylaws that significantly changed its operations. It allows for new organizations to join, bringing broader input from the engineering community. To maintain consistency in leadership and representation, member organizations appoint representatives to three-year terms, and organizations are not required to appoint their presidents and presidents-elect. Also, to control costs and enhance effectiveness, USCIEP will appoint task forces to carry out specific activities. The task forces may be composed of USCIEP members or nonmembers, depending on the expertise required, and funding may be contributed by a sponsoring organization.

With the ratification of its new constitution and bylaws, USCIEP moved away from discord to cooperation and productive activity. The 2002 USCIEP International Registry is one example of the foundation USCIEP is laying toward international mobility of engineers. Perhaps because of its official and visible role in negotiations for the NAFTA-MRD, USCIEP received increasing attention from foreign government agencies and international organizations in the late 1990s. Some groups sought USCIEP's advice or information regarding the regulation of engineering practice in the United States, while others wished to pursue mutual recognition agreements. Participation in the APEC Engineer project, Engineers Mobility Forum (EMF), Transatlantic Economic Partnership, and other endeavors linked USCIEP with a worldwide network of professional and technical societies and government entities that have been responsible for granting engineers practice rights at the professional level. This greater level of involvement gave USCIEP a deeper understanding of foreign licensure systems and led to the development of the USCIEP International Registry for Professional Engineers.

USCIEP launched its international registry in 2002 to assist professional engineers licensed in the United States who wish to practice in other countries. Although the USCIEP International Registry is new at this writing, the USCIEP envisions that this program will operate in a manner similar to the NCEES Records Program, except on an international scale. Once the program is fully implemented and bilateral agreements with other countries are in place, many entities stand to benefit from its services—professional engineers working in the United States and abroad, non-U.S. engineers who are recognized for independent practice in other countries, and U.S. engineering licensing boards.

The USCIEP International Registry is part of two larger international registries—one sponsored by the APEC Engineer Coordinating Committee and the other by EMF. APEC and EMF intend to aid international mobility by encouraging each member country (those countries that are signatories to the APEC and EMF) to establish a register, or list, of its professional engineers. The registries are decentralized, meaning that each country operates its own section of the registry and writes its own Assessment Statement, a document that describes the requirements for applying to practice engineering in that country. An authorized body, or Monitoring Committee, is formed in each country to develop an assessment statement, maintain the registry, function as the single point of contact for all matters relating to the registry, and report to the respective international Coordinating Committees of APEC and EMF.

The USCIEP International Registry is the official APEC and EMF registry for the United States. According to its Assessment Statement, written largely by Monitoring Committee Chair L. G. "Skip" Lewis Jr., P.E. (NCEES Past President 1996–1997), only engineers licensed in one or more of the jurisdictions of the United States who meet specified requirements are eligible for listing in the registry. The ultimate goal of the USCIEP registry is to streamline the process for experienced U.S. professional engineers who wish to practice in any of the 13 other APEC and/or EMF member countries: Australia, Canada, China, Hong Kong, Indonesia, Ireland, Japan, Korea, Malaysia, New Zealand, the Philippines, South Africa, and the United Kingdom. Because of the decentralized nature of the registries, USCIEP is free to specify the requirements for its members. The USCIEP registry program does not exempt engineers (U.S. or foreign) from examination requirements nor does it relax any other requirements for licensure within the United States. As a member of a registry, an engineer is accorded mutual recognition of professional qualifications in member countries of APEC and EMF. Mutual recognition of professional qualifications does not, however, automatically bestow a right or privilege to practice professional engineering within another APEC or EMF member country. It is expected, though, that recognition in the international registry will simplify the application process between member countries and may, in some cases, substantially reduce the additional assessment processes required to obtain a license or permit to practice in a foreign jurisdiction.

The member organizations of USCIEP, including NCEES, consider the USCIEP International Registry important to the interests of professional engineers. After careful review of the APEC and EMF registries' purpose and structure, USCIEP determined that participation in the registries is a unique opportunity that serves the best interests of professional engineers and licensing authorities in the United States. Participation does not relax any requirements for licensure within the United States and does not override the jurisdiction of state licensing boards. Instead, it allows the United States to be represented throughout the world with entities addressing intercountry mobility of licensed engineers, and it enhances the opportunity for licensed U.S. engineers to practice in economies other than the United States. The USCIEP International Registry provides a vehicle through which, based upon separate bilateral agreements, at least partial exemption from mobility assessment might occur. The USCIEP Web site (www.usciep.org) contains information and applications for the registry.

USCIEP continues to be an important point of contact for international mobility projects, as well as a conduit for networking with licensing organizations and officials in other countries.

At this writing, the following people have served as NCEES representatives to USCIEP:

- 1995, Charles Kimberling, Bill Karr, Warren Fisk, and Skip Lewis
- 1996, Warren Fisk, Skip Lewis, and Steve Schenk
- 1997, Skip Lewis, Steve Schenk, and Andrew Liston
- 1998, Steve Schenk and Andrew Liston
- 1999, Andrew Liston and Dale Sall
- 2000, Dale Sall, Andrew Liston, and Skip Lewis
- 2001, Dale Sall and Skip Lewis
- 2002, Ted Fairfield and Dale Sall
- 2003, Dale Sall and Ted Fairfield

Building Addition Dedicated

The beautiful sunny day, mild temperatures, and newly landscaped grounds provided the perfect setting for the dedication of the Council's newly renovated, 13,000-square-foot building addition on

March 21, 2004, in Clemson, South Carolina. The dedication ceremony featured several speakers, including NCEES Executive Director Betsy Browne; Master of Ceremonies Dale W. Sall, P.E., L.S., President of NCEES in 1999–2000; President Donald L. Hiatte, P.E.; and Keynote Speaker U.S. Senator Lindsay Graham.

In the May edition of *Licensure Exchange*, published just after the dedication, Browne says, "What an honor and pleasure it was to have 17 Past Presidents of the Council and their spouses, board members, state and local dignitaries, and Council staff on hand to celebrate the Council's past and future. I asked Ted Stivers, P.E., President of the Council in 1976, to summarize the Council's history. Having been to 35 consecutive Annual Meetings himself, Ted is certainly an appropriate person to recount the evolution of the Council." In his speech, Stivers said of the Council, "Our progress has been more like an old oak than an amaryllis, with slow but steady growth, with thousands of volunteer hours, much work by dedicated members and staff, and millions of dollars invested in the latest techniques and procedures. Today few could deny that we have an enviable and efficient exam program, and perhaps one of the most legally defensible of any profession."

Renovation of the existing 25,000-square-foot facility and construction of the addition began in 2002 and was completed in early 2004. The Council had grown from 24 to 57 staff members in five years and was in desperate need of space. The newly finished building includes ample conference space for exam development volunteers who often gather at Council headquarters to write items for NCEES engineering and land surveying licensing exams. In his opening remarks, Sall noted that "The Council has a history of steady growth. In 1981, 15 employees moved into a new 12,500-square-foot building—what is now the majority of the first-floor wing. The operating budget was $1.5 million. In 1990, a 12,500-square-foot addition was added to accommodate 23 employees and provide ample meeting space for exam volunteers. With a budget of $3.2 million, Council services to Member Boards and examinees were growing steadily. Now, in 2004, a staff of 57 manages an operating budget of $11 million in a facility of nearly 38,000 square feet."

In his welcome address, President Hiatte credited "the health and growth of the Council…to the strong and wise leadership provided by the successive Boards of Directors who have served over the years and our Executive Director, Betsy Browne." He further writes, "…this building is the headquarters of an organization that extends throughout every state of our nation and its territories. The work of the Council is carried out daily in the offices of each of the licensing boards. So, in a sense, this building serves as a symbol, a focal point, of a tremendous amount of activity that occurs to further the cause of protecting the health, safety, and welfare of the public, and also to serve the needs of practicing engineers and surveyors whose skills are employed for the betterment of our citizens."

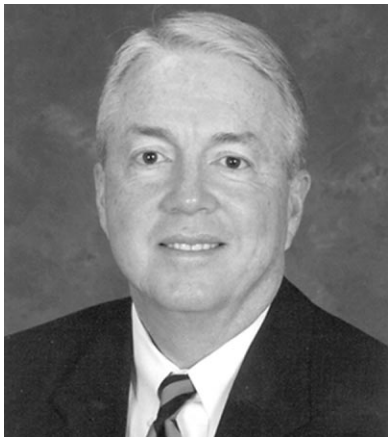
Seventeen Past Presidents attended the Council's building dedication ceremony. Seated, left to right: Robert Krebs, Richard Cottingham, Ted Stivers, Paul Munger, John Lyons, Morton Fine, Alfred Samborn, Dennis Meyer.
Standing, left to right: Bill Karr, Dave Sellards, Dale Sall, Ted Fairfield, John Steadman, Charles Kimberling, Eugene Bechamps, Sam Wainwright, Skip Lewis.

L. G. Lewis, Jr.
South Carolina
1996–1997

Steven T. Schenk
Oregon
1997–1998

Andrew B. Liston
Massachusetts
1998–1999

Dale W. Sall
Nebraska
1999–2000



J. Richard Cottingham
North Carolina
2000–2001

Ted C. Fairfield
California
2001–2002

Robert C. Krebs
Vermont
2002–2003

Donald L. Hiatte
Missouri
2003–2004

Appendix 1
Past Presidents

1920–1921	*Marcel Garsaud New Orleans, LA	1935–1936	*James L. Ferebee Milwaukee, WI
1921–1922	*C. S. Hammatt Jacksonville, FL	1936–1937	*J. S. Dodds Council Bluffs, IA
1922–1923	*John J. Cox Ann Arbor, MI	1937–1938	*S. H. Graf Corvallis, OR
1923–1924	*G. M. Butler Tucson, AZ	1938–1939	*Charles F. Scott New Haven, CT
1924–1925	*L. M. Martin Ames, IA	1939–1940	*A. C. Polk Birmingham, AL
1925–1926	*P. H. Daggett Chapel Hill, NC	1940–1941	*Virgil M. Palmer Rochester, NY
1926–1927	*Paul Doty St. Paul, MN	1941–1943	*C. C. Knipmeyer Terre Haute, IN
1927–1928	*George E. Taylor Charleston, WV	1943–1944	*Carl Svensen Austin, TX
1928–1929	*James R. Rhyne Little Rock, AR	1944–1946	*H. T. Person Laramie, WY
1929–1930	*C. G. Massie Lynchburg, VA	1946–1947	*J. C. Remington, Jr. Camden, NJ
1930–1931	*T. Keith Legaré Columbia, SC	1947–1948	*G. M. Shepard St. Paul, MN
1931–1932	*D. B. Steinman New York, NY	1948–1949	*Alexander Blair Lake Placid, FL
1932–1933	*O. Laugaard Portland, OR	1949–1950	*Clarence L. Eckel Boulder, CO
1933–1934	*N. W. Dougherty Knoxville, TN	1950–1951	*R. G. Warner New Haven, CT
1934–1935	*Ralph J. Reed Los Angeles, CA	1951–1952	*C. S. Crouse Lexington, KY

1952–1953	*A. G. Stanford Atlanta, GA
1953–1954	*Stanley G. Palmer Reno, NV
1954–1955	*John W. Gore Baltimore, MD
1955–1956	*Bruce Williams Joplin, MO
1956–1957	*E. R. Stapley Stillwater, OK
1957–1958	*Allen S. Janssen Moscow, ID
1958–1959	*William H. Larkin New York, NY
1959–1960	*L. E. McCartt S. Fort Mitchell, KY
1960–1961	*O. B. Curtis, Sr. Jackson, MS
1961–1962	*A. L. Henny Portland, OR
1962–1963	*Weston S. Evans Orono, ME
1963–1964	*William M. Spann Kansas City, MO
1964–1965	*John Ward Beretta San Antonio, TX
1965–1966	*Leo W. Ruth, Jr. San Jose, CA
1966–1967	*D. E. Marlowe Washington, DC
1967–1968	*E. R. Whitehead Brookfield, IL
1968–1969	*G. F. Branigan Fayetteville, AR
1969–1970	*W. Morgan Allen Portland, OR
1970–1971	*Chester A. Arents Morgantown, WV
1971–1972	*Anthony L. Bavone Minot, ND
1972–1973	*Roy T. Sessums New Orleans, LA
1973–1974	*Orland C. Mayer Boise, ID
1974–1975	Morton S. Fine West Hartford, CT
1975–1976	*H. A. Moench Terre Haute, IN
1976–1977	T. E. Stivers Decatur, GA
1977–1978	William J. Hanna Boulder, CO
1978–1979	*F. H. Rogers, Sr. Columbia, MD
1979–1980	Alfred H. Samborn Toledo, OH
1980–1981	E. N. Bechamps Coral Gables, FL
1981–1982	Albert T. Kersich Billings, MT
1982–1983	*William E. Carew, Jr. Wilmington, DE
1983–1984	Paul R. Munger Rolla, MO
1984–1985	Sam H. Wainwright Dothan, AL
1985–1986	*Edward L. Pine Reno, NV

1986–1987	*J. Harry Parker Boston, MA
1987–1988	Dennis F. Meyer Bismarck, ND
1988–1989	Charles L. Kimberling Tulsa, OK
1989–1990	George D. Sellards Denver, CO
1990–1991	John E. Lyons Merrimack, NH
1991–1992	William L. Karr Sault Ste. Marie, MI
1992–1993	Paul Taylor Decatur, AL
1993–1994	John W. Steadman Laramie, WY
1994–1995	*Leon H. Clary Mendon, NY
1995–1996	Warren L. Fisk Rapid City, SD
1996–1997	L. G. Lewis, Jr. Greenville, SC
1997–1998	Steven T. Schenk Lake Oswego, OR
1998–1999	Andrew B. Liston Boylston, MA
1999–2000	Dale W. Sall Holdrege, NE
2000–2001	J. Richard Cottingham Raleigh, NC
2001–2002	Ted C. Fairfield Pleasanton, CA
2002–2003	Robert C. Krebs South Hero, VT
2003–2004	Donald L. Hiatte Jefferson City, MO

*Deceased

Appendix 2
Annual Reports

Minutes of the 1920 Meeting of the Council of State Boards of Engineering Examiners Held at Chicago, Illinois, November 8–9, 1920
Chicago, Illinois, Nov. 8, 1920

In response to the call of the Iowa State Board of Engineering Examiners, there convened at the Hotel Sherman, Chicago, Illinois, Nov. 8, 1920 a convention of members of the Boards of Engineering Examiners and Registration Boards and officials as follows:

Colorado	R. G. Hosea, Assistant Secretary	Denver
Michigan	John J. Cox, Secretary	Ann Arbor
Michigan	C. G. Olmstead, Office Manager	Detroit
Iowa	F. W. Stubbs, Chairman	Oelwein
Iowa	L. M. Martin, Vice Chairman	Atlantic
Iowa	K. C. Kastberg, Secretary	Des Moines
Iowa	Alvin LeVan	Des Moines
Iowa	Seth Dean	Glenwood
Florida	C. S. Hammatt	Jacksonville
South Dakota	John Berg, State Engineer	Pierre
Louisiana	Marcel Garsaud, Secretary	New Orleans
Illinois	F. C. Dodds, Supt. of Registration	Springfield
	I. F. Stern, Board of Structural Engineers Examiners	
	Andrews Allen, Board of Structural Engineers Examiners	Chicago
	T. L. Condron, Board of Structural Engineers Examiners	
	F. C. H. Arentz, Board of Structural Engineers Examiners	

Mr. W. W. DeBerard, of Chicago, representing the "Engineering News Record," Mr. C. B. Smith, of Chicago, representing "Professional Engineers," and Mr. C. E. Drayor, of Chicago, Secretary of the American Association of Engineers, were also present.

Temporary organization was effected with Seth Dean of Glenwood, Iowa, as chairman, and K. C. Kastberg of Des Moines, Iowa, Secretary.

Mr. Kastberg introduced the representatives of the several boards of engineering examiners and read the "call" for the meeting stating the purpose as follows:

It having developed, in the application of the laws for the registration of Professional Engineers, Land Surveyors and Architects, that there should be an organized and systemized method of procedure to be followed in the interstate registration, that there should be a uniform basis of examination and registration, that a convention for the purpose of arriving at a working plan and an understanding of the scope, plan and procedure of the several Boards was desirable and practical. Further, that it appeared to be desirable to effect a form of permanent organization to arrive at the best understanding and to facilitate the business of state and interstate registration.

The several boards through their members and representatives explained the features of their laws and the method or application of the laws, giving in detail the essential points and answering inquiries as put from time to time.

Mr. Cox, (Michigan) explained the scope and character of the Michigan examination and stated that the character of examination was governed in part by the scope of experience and qualification of the applicant. Mr. Hammatt, (Florida) explained the operation of the Florida law, and the character of examination. Stress was placed upon the professional experience of the applicant.

Mr. Garsaud, (Louisiana) in explaining the Louisiana law, stated that since 1908 all applicants were required to appear before the Board and were registered by diploma from a recognized school of engineering or by examination.

He explained that a passing grade of 70 percent was required of which experience must be 40 percent and technical training 30 percent. He explained the distinction made between the engineer and surveyor and that provision had been made by recent statute for reciprocity to be granted to registered engineers of other states, who were in good standing in their own state, provided said states granted Louisiana the same privileges. He stated that all public officers holding office of engineering character were required to be registered.

Mr. Dodds, Superintendent of the Illinois Department of Registration, explained that all professions were registered under one bureau, but that the examination and certifications were conducted and submitted by separate boards, the activities of the engineers being supervised by the professional Committee for Structural Engineers. Mr. Stern explained that it was formerly the custom to give a uniform detailed examination to all applicants, but that the plan was being revised and that the applicants were required to submit evidence of their professional attainment and experience, and to be later examined along technical lines as was necessary to determine their qualifications. Mr. Dodds, distributed the form of the Illinois application and explained same.

Mr. Stubbs, (Iowa) gave a brief outline of the plan and scope of the Iowa examinations. All Iowa applicants were required to submit a complete detailed record of their preliminary educational and technical training and professional practice; the written examination to cover a general practical examination in engineering subjects and a specialized examination along the lines of their professional specialty. An oral grading or observation examination by which the candidate was rated by all board members for proficiency, educational attainment, executive ability, character and experience. The final rating to be based upon a credit of 60 percent for technical and 40 percent for oral examination. A passing grade of 70 percent was required.

Mr. Hosea, (Colorado) stated that their applicants were rated 50 percent on technical and 50 percent on experience, a requirement of 70 percent for registration being obligatory.

The Colorado law at present made no provision for reciprocity, but they are working for an amendment to provide same in future. At present visiting consulting engineers are permitted to practice, by making application and being examined. He explained that the larger percent of their engineers were engaged in mining engineering operations.

The question of other than structural engineers being registered in Illinois was brought up by Mr. Cox, (Michigan) Mr. Stern, (Illinois) explained that if the practice involved features of structural design, then the registration was required—otherwise not. The discussion was active along the lines of comparison of requirements of the Illinois law as compared with the other states. It has developed that in order to secure proper working arrangements the Illinois Board had adopted a plan of examination which would work out practicably with other States in the matter of reciprocal arrangements, but that

in order to comply with the requirements of the present Illinois Structural Engineers License and Registration Law examinations were imperative. The type and scope of examinations, as explained by the members of the Illinois Board, were wholly satisfactory to the other boards and was such as would work out satisfactorily as a basis of interchange of registration.

Mr. Cox, (Michigan) explained the scope and character of the several classes of examination given by the Michigan board. He explained that the law required a classified registration, although it was not the opinion of their board that this was a desirable arrangement.

Upon the invitation of the Structural Engineers Association of Illinois, extended by Mr. Andrews Allen, the convention was entertained at luncheon at the Chicago Engineers Club, following which the meeting was continued at that place.

The features of the Michigan law were thoroughly discussed.

Mr. Garsaud, (Louisiana) discussed the phraseology, etc., of the structural engineer law and its application to men of large experience.

Mr. Stubbs, (Iowa) referred to the application of Engineering Registration laws to itinerant salespeople, and the installation of electrical and mechanical equipment which was now being done, without the safeguard of good engineering supervision. He pointed out the necessity of active surveillance in such matters.

Mr. Hammatt, (Florida) discussed the limitations between the professional practitioner and the artisan, and indicated that minor installation and housewiring would scarcely be considered in the field of professional engineering.

Mr. Allen and Mr. Stern, (Illinois) discussed the features of the new method of registration of general engineers in Illinois, insofar as the Structural Engineers Registration law could be brought to bear upon general engineering practice. The status of board members with relation to reciprocal registration was introduced by Mr. Stern, and was the subject of a general discussion.

The proposed "Uniform Registration Law," as formulated by Engineering Council, Oct. 31, 1920 was introduced by Mr. Condron and carefully perused by the delegates. Notations of proposed changes in the pamphlets of Dec. 4, 1919 were made.

Mr. Dodds, (Illinois) introduced the question of how a registered engineer of Illinois might secure registration in other states, when no reciprocity had been provided for by Illinois. Illinois is committed, by an opinion by the state's attorney general, to examinations. The discussion brought out the general expression that the registration would be granted upon appearance before the boards with acceptable evidence of experience and proficiency. Motion, by Mr. Dodds, (Illinois).

It is the sense of the states represented that where a qualified engineer obtains a contract he be permitted to proceed with the same, and that he file an application and pledge himself to appear for examination at the next board meeting. Carried.

Motion by Mr. Cox, (Michigan) that the several states proceed in an effort to standardize the examination—insofar as possible, carried.

Mr. Cox, (Michigan) suggested a plan of organization and intercommunication, Mr. Stern, (Illinois) motion:

We organize as an association of professional committees to formulate rules, etc. Carried. Mr. Stern, (Illinois) motion:

That those bodies entrusted with the execution of the Registration laws be invited to join with the Boards of Registration in the organization, carried.

Motion by Mr. Cox, (Michigan).

Proceed with the organization at once. Carried.

A committee consisting of Mr. Hammatt, Mr. Garsaud and Mr. Stern was appointed by the chair to prepare and submit at the meeting Nov. 9, at 10 a.m. a form of constitution and by-laws for the organization and operation of a Council of Boards of Engineering Examiners.

Adjournment to 10 a.m. Nov. 9.

K. C. Kastberg,
Secretary—Pro Tem

Nov. 9, 1920

The convention, in temporary organization convened at 10 a.m. at Hotel Sherman.

Mr. Dean, Chairman—Pro Tem.

K. C. Kastberg, Secretary—Pro Tem.

The report of the committee on constitution was presented and placed on file. The constitution and by-laws were read and revised and adopted as per official copy herewith.

Permanent organization was effected with the following officers:

Marcel Garsaud, president, New Orleans, La.

C. S. Hammatt, vice-president, Jacksonville, Fla.

Alvin LeVan, secretary-treasurer, Des Moines, Iowa.

The convention was then turned over to the permanent organization.

K. C. Kastberg,
Secretary—Pro Tem.

Motion by Mr. Hammatt, (Florida) that the Council of State Boards of Engineering Examiners proceed with the regular order of business. Carried.

Mr. Condron, (Illinois) stated the objects and requirements of Executive Council's Model Law which was followed by an informal discussion by Mr. Hammatt and Mr. Drayer, Secretary of the American Association of Engineers.

Motion by Mr. Condron, (Illinois).

That it is the sense of this Council that the submission of the evidence of qualification of the applicant for the practice of professional engineering should be considered as the essential part of the examination and the reciprocal registration certificates should be granted to the applicant who has submitted such satisfactory evidence to the examining board of his own state. Motion carried.

Motion by Mr. Hammatt, (Florida).

Resolved that those who have been appointed on state boards of engineering examiners represented to this Council be granted reciprocal registration certificates without examination.

Motion seconded by Mr. Condron, (Illinois). Motion carried.

Motion by Mr. Dean.

That the city of St. Louis be selected as the place of the next regular meeting of the Council. Motion carried.

Motion by Mr. Hammatt.

That copies of the minutes of this conference be sent to the different states having registration laws. Motion carried.

The chair expressed appreciation of the courtesies extended the council members by the Illinois Board and the Structural Engineers Association of Illinois.

Motion by Mr. Dean to adjourn. Motion carried.

Alvin LeVan,
Secretary

Secretary-Treasurer's Report—1921

Your secretary-treasurer respectfully submits the following report:

At our meeting in Chicago, Nov. 8, 9, 1920 the following states viz; Colorado, Florida, Illinois, Iowa, Louisiana, Michigan, and South Dakota constituted the membership in our association. Other states having laws for the registration of engineers but which were not represented were Idaho, New York, Oregon, Virginia, and Wyoming. During the winter of 1920 and 1921 registration laws were enacted by the legislatives of Arizona, Indiana, Minnesota, North Carolina, New Jersey, Tennessee and West Virginia, bringing the number of states having some sort of a law for the licensing and registration of engineers up to nineteen. The South Dakota law licenses land surveyors only.

As soon as these states had passed their laws your secretary wrote the various secretaries of states for the names of the members of their examining boards. The replies were slow in coming in, many of the boards not having been appointed until just recently. To date he has not learned the personnel of the boards of West Virginia, and New Jersey. He is advised by Mr. Robert Jones, commissioner of law enforcement for the state of Idaho that that state has no permanent board of examiners but that temporary boards are appointed from time to time to conduct examinations.

After our meeting in Chicago, your secretary had one hundred copies of minutes of our meeting made and sent them to the various state boards represented. During the past year, he has had requests for more copies. Copies have been sent to the states recently passing license laws and he now has on hand twelve copies.

During the month of January 1921, the Louisiana Board passed a resolution providing for engineers licensed in that state to appear before their board and take an examination for the purpose of qualifying them for reciprocal licenses. Copies of these resolutions were sent to the various members of the council. Following the action of the Louisiana Board, the Iowa Board passed a similar resolution.

As treasurer, he reports as follows:

Receipts

Cash on hand	$0.00
Received cash	0.00
Total	$0.00

Disbursements

100 copies of minutes of first annual meeting	$34.20
Stationery	12.10
Cover and paper for record of minutes	3.95
Postage	2.50
	$52.57

Respectfully submitted,
Alvin LeVan,
Secretary-Treasurer

Minutes of the 1922 Annual Meeting of the Council of State Boards of Engineering Examiners Held at the Statler Hotel, St. Louis, Missouri, Oct. 3, 1921

St. Louis, Missouri, Oct. 3, 1921

The second annual meeting of the Council of State Boards of Engineering Examiners was called to order at 10:00 a.m. Oct. 3, 1921, at the Hotel Statler, St. Louis, Missouri, President Marcel Garsaud of New Orleans, LA., presiding, and Secretary Alvin LeVan of Des Moines, Iowa, acting as secretary. The first order of business was the examination of credentials of delegates.

Eight states were represented, as follows:

1. Colorado.	R. G. Hosea, Acting Secretary State Board of Engineer Examiners.
2. Florida.	C. S. Hammatt, President State Board of Engineer Examiners.
3. Indiana.	R. L. McCormick, President State Board of Registration for Professional Engineers and Land Surveyors.
	DeWitt Moore, Secretary State Board of Registration for Professional Engineers and Land Surveyors.
	Charles W. Cole, Member State Board of Registration for Professional Engineers and Land Surveyors.
	H. M. Anthony, Member State Board of Registration for Professional Engineers and Land Surveyors.
4. Iowa.	Alvin LeVan, Member State Board of Engineering Examiners.
5. Louisiana.	Professor Donald Derickson, Member State Board of Engineering Examiners.
	Marcel Garsaud, Member State Board of Engineering Examiners.
6. Minnesota.	Paul Doty, Chairman State Board of Registration for Engineers, Architects, and Land Surveyors.
7. North Carolina.	P. H. Daggett, Member Board of Registration for Engineers and Land Surveyors.
8. Oregon.	F. D. Weber, Member State Board of Engineering Examiners.

States represented at 1920 meeting but not sending delegates in 1921 were Illinois, Michigan and South Dakota. South Dakota does not expect to become a member of this council at present since her license law applies only to surveyors.

Illinois and Michigan were unfortunately unable to send delegates to this meeting but expect to retain membership in this Council.

Present membership in the Council of State Boards of Engineering Examiners therefore includes the following ten states:

Colorado, Florida, Illinois, Indiana, Iowa, Louisiana, Michigan, Minnesota, North Carolina and Oregon.

(Other states having engineering license laws, but not as yet members of the council are Arizona, Idaho, New Jersey, New York, Pennsylvania, Tennessee, Virginia, West Virginia and Wyoming.)

Minutes of 1920 meeting of the Council were read and approved.

Report of secretary-treasurer was read and approved and the Secretary was instructed to prorate the expense incurred during the year (viz. $52.75) among the State Boards composing the Council

during the past year, viz. Colorado, Florida, Illinois, Iowa, Louisiana and Michigan. (This will amount to $8.80 each.)

President Garsaud read certain correspondence between the boards of Louisiana, Illinois and Iowa, and explained the Louisiana idea of holding examinations for their own engineers, licensed under the waiver or "grandfather" clause, and the granting of reciprocal registration certificates to the successful applicants. In line with the motion made by Mr. Condron at the 1920 meeting of the council, the essential part of such an examination is to be the submission of satisfactory evidence of qualification to the applicants own board.

Discussion of the various laws and methods of procedure of the various boards was precipitated by questions of representatives of the states of Indiana, Minnesota and North Carolina, where the license law has only been in operation a short time. This discussion was general and was participated in by the delegates from Florida, Colorado, Iowa, Louisiana and Oregon.

Moved by Mr. Doty of Minnesota, that a committee of three, consisting of Mr. Hammatt of Florida, Prof. Derickson of Louisiana and Mr. Hosea of Colorado, be appointed to formulate a standard of examination for reciprocal registration certificates, and to report, either at the afternoon session or the day following.

Discussion ensued which brought out the fact that it would not be possible for a committee to make such a study and report in any such length of time. Mr. Doty at length withdrew his motion.

Motion to adjourn for luncheon until 2:30 p.m. carried.

Meeting called to order at 2:30 p.m.

After some discussion Mr. Weber of Oregon moved that the president of the council of

State Boards of Engineer Examiners, appoint from the membership of said Council, a committee of three for the purpose of collecting all data concerning the requirements of all license laws for the licensing or registration of architects, engineers and land surveyors, and for the further purpose of recommending to the said Council, a uniform standard of qualification for registration or license, and a uniform standard of examination in order that said council may reach a basis upon which the various states may enter into reciprocal relations.

Discussion, ending in withdrawal of this motion and the substitution of the following.

Motion. That the President of the Council of State Boards of Engineer Examiners, appoint from the membership of said Council, a committee of three to examine the state laws providing for the registration of engineers and the custom and rule of procedure of the different boards in the examination of applicants and to make suggestions and recommendations for uniformity of practice so far as the same can legally be done by the different state boards and to provide for reciprocal relations between the state boards for granting registration license to applicants from other states on equal terms of examination. This committee to meet at the call of its chairman at a date not later than March 1, 1922. Copies of the minutes of all meetings of this committee, together with its reports and recommendations to be sent to the Secretary of the Council, for distribution among the various state boards.

Motion carried.

Motion by Mr. Daggett of North Carolina:

That the same method of procedure in regard to reciprocal relations which has prevailed for the past year be continued for the coming year. Carried.

Mr. William Rolfe of St. Louis, appeared before the council and explained briefly the changes made in the so-called Engineering Council Uniform License Law, at the recent (Sept. 1921) Chicago meeting of the committee on licensing of the Federated American Engineering Societies.

The Secretary was instructed to write Mr. Wallace, Executive Secretary F. A. E. S. Washington, D.C. asking that copies of the amended uniform license law be sent to members of the Council.

Moved, seconded and carried that the next regular meeting of the Council be held in Chicago on the first Monday of October, 1922.

Election of officers.

Mr. C. S. Hammatt of Florida was unanimously elected President of the Council for the ensuing year. Mr. Alvin LeVan of Iowa was elected Vice-President and Mr. R. G. Hosea of Colorado, Secretary-Treasurer.

The new officers now took their chairs.

Mr. Hammatt suggested that the retiring president appoint the committee on "uniform reciprocal relations."

Mr. Garsaud accordingly appointed:

Mr. Hammatt of Florida—chairman.

Prof. Derickson of Louisiana.

Mr. Hosea of Colorado.

Prof. Derickson declined the appointment on the ground of lack of time. Mr. Hammatt thereupon appointed Mr. Garsaud of Louisiana in his place.

After a general discussion on the scope of "grandfather clauses" the meeting adjourned.

R. G. Hosea,
Secretary

Note: The Hotel Statler, St. Louis, gave the Council the use of a room for this meeting, without charge.

Secretary-Treasurer's Report—1923

To the Members of the Council of State Boards of Engineering Examiners:

I have the honor to present the report of the Secretary-Treasurer for the current year.

Of the fifteen states represented by delegates at the 3rd Annual Meeting, twelve have ratified the Articles of Agreement, as follows:

Florida	Oct. 3, 1922
Michigan	Oct. 13, 1922
Indiana	Oct. 13–14, 1922
Arizona	Oct. 14, 1922
Oregon	Nov. 10, 1922
Louisiana	Nov. 23–24, 1922
Iowa	Dec. 2, 1922
Colorado	Dec. 9, 1922
North Carolina	Dec. 20, 1922
West Virginia	Dec. 27, 1922
Minnesota	Jan. 15, 1923
South Carolina	June 19, 1923

New Jersey, having decided to await further observation of the working of their law, has declined for the present to ratify the Articles.

Wyoming has not been heard from, although repeated attempts have been made to find out what action they expect to take.

Mr. Condron, of Chicago, who represented the Illinois Department of Registration and Education, recommended favorable action to Mr. Shelton, Director of the Department. Mr. Shelton, however, after a careful study, felt that a majority of the Articles were quite incompatible with the Illinois law.

Mr. Shelton's most outstanding difficulty seemed to lie in the first sentence of Article 1, and your secretary accordingly wrote the three members of the reciprocity committee, which framed the articles, for their interpretation of this particular article. The replies received indicated the advisability of referring the matter to the next Council meeting, as provided for in Article 10, and accordingly this question has been placed on the program of this meeting under New Business.

Copies of the Articles were sent to all state boards that have been established. The only one, however, that has notified your secretary of an action thereon is the New York Board which has declined.

During the year, we have had mimeographed 100 copies of the minutes of the 3rd Annual Meeting, 200 copies of the Articles of Agreement on Reciprocity and 100 copies of the Constitution and By-Laws. There are on hand the following:

1 copies of the Minutes of the 1st Meeting.
26 copies of the Minutes of the 2nd Annual Meeting.
37 copies of the Minutes of the 3rd Annual Meeting.
83 copies of the Constitution and By-Laws.
97 copies of the Articles of Agreement on Reciprocity.

There are now 24 states having some sort of registration law for engineering or land surveying. Of these, 17 have comprehensive laws. Of the other 76, the California, Nevada, New Mexico and South Dakota laws apply only to Land Surveying; the Idaho law to civil engineering, the Illinois law to structural engineering and the Wyoming law to drainage, highway, municipal, county and state projects.

A registration law has recently become effective in Hawaii. Copies of the Constitution and By-Laws and of the Articles of Agreement have been sent to that board.

In conclusion, the writer ventures the following suggestions for making the work of the Council more effective, and of greater value to the various members:

1. In a more or less informal organization of this sort it seems desirable to have the tenure of office of the Secretary longer than one year.

2. That the Secretary's office be made a clearing-house for information regarding the activities of the various boards. President Anthony of the Indiana Board has written a letter embodying a number of excellent suggestions along this line.

3. The desirability of some form of check on the issuance of Reciprocity Cards.

4. The appointment of a committee to study the application forms of the several boards with a view to recommending a standard form of application for registration, so far as the same may be possible under the several laws.

Respectfully submitted,
P. H. Daggett
Secretary-Treasurer.
East Milton, Mass.
Sept. 29, 1923.

Secretary-Treasurer's Report—1924

To the Members of the Council:

I have the honor to submit the following report for the period from Oct. 2, 1923 to Nov. 10, 1924.

Copies of the following were mailed out to all Boards: Minutes of the 4th Meeting, Revised Articles of Agreement, Revised Constitution, Report of Committee on Application Blanks, Resolution for Membership in Council, Letter regarding changes in Constitution, Letter regarding changes in Articles of Agreement, Letters to Boards not members of Council. (Much of the above was prepared and sent out by President Butler without cost to the Council.)

The Secretary has been notified by ten Boards of the formal acceptance of the revised Articles of Agreement.

At the last meeting it was reported that three states had failed to pay their assessment for the previous year. These states have all paid this assessment during the past year. Notices of assessments for 1924 were not sent out until Oct. 10 and therefore very few Boards have had time to pay the assessment for this year. Ten thousand reciprocity cards were printed by the Council last year at a cost of $108.00, and as only twelve states had applied for reciprocity cards amounting to a total of 4000 issued, the total cost had to be assessed against these states at the rate of .027 each. The assessment for expenses of the Council has been fixed at $5.00 and this will be sufficient to pay all expenses and indebtedness of the Council to Jan. 1, 1925.

The Secretary has prepared a list of all States having engineer registration boards giving the address of the secretaries and as soon as this list has been checked and revised at this meeting of the Council a copy will be furnished each Board. We find that twenty states, not including Hawaii, have engineer's registration laws and all except six are now members of the Council as shown on the list referred to.

As reciprocal registration will not be a complete success until all states have laws regulating the practice of engineering your Secretary suggests that the Council should take some definite action regarding the promotion of registration laws in other states and as one means to this end, recommends that the Council issue a year book containing: a model registration law, the Articles of Agreement on Reciprocal Registration, list of States now having registration laws, minutes of the last meeting of Council and such other information as may be advisable. It is doubtful if the Council could raise funds for the above and it is suggested that this may be handled with the cooperation of the American Association of Engineers.

It is also recommended that the date of annual meeting be changed to the first Monday instead of the second Monday of November in order not to conflict with Armistice Day. It seems advisable that the name of the Council be simplified and also changed to include the word National, such as National Council of Engineer's Registration Boards, National Council of Engineering Examiners. When the membership of the Council increases it will probably be necessary to establish permanent headquarters for the Council in order that the records may be properly kept and the clerical work efficiently handled.

A map showing the geographical location of all states having engineers' registration laws has been prepared and this will be of use in considering the place of next meeting, etc.

T. Keith Legaré
Secretary-Treasurer

Secretary-Treasurer's Report—1925

To the Members of the Council:

I have the honor to submit the following report for the period from Nov. 10, 1924 to Nov. 10, 1925:

Minutes of the fifth annual convention held in Washington were mimeographed and copies mailed to all registration boards and those who attended the meeting, making a total of 35 sets. Five thousand application blanks for national reciprocity were printed and 200 copies furnished to every board which has ratified the Articles of Agreement. A large amount of correspondence has been handled during the year and we have furnished information regarding registration laws to committees in states which were endeavoring to have legislation adopted. Fifty notices regarding this convention were mailed to interested parties.

The Secretary directed letters to every registration board and has compiled lists showing corrected addresses of Secretaries of all boards, members of Council and others separated, and also parties interested in prospective legislation. A copy of these lists have been furnished all Board members of Council.

The following 23 states, including Hawaii, now have engineering registration laws and the first 14 named are now members of Council: Arizona, Colorado, Florida, Indiana, Iowa, Louisiana, Michigan, Minnesota, North Carolina, Oregon, South Carolina, Virginia, West Virginia, Wyoming, Arkansas, Hawaii, Idaho, Illinois, New Jersey, New York, Pennsylvania, South Dakota and Tennessee. It is expected that Tennessee, South Dakota and Arkansas will join the Council at the next meeting of their respective Boards. The following states have legislation pending and the Secretary will make a report on each when presenting communications: California, Georgia, Missouri, Ohio, Oklahoma, Utah, Washington and Wisconsin.

All assessments for 1924 were promptly paid and New Jersey, which was not included in the list reported last year also paid assessment. Sixteen states shared in expenses of the Council last year. With the approval of the President we have not sent out assessments for 1925 but have decided to wait until after this meeting when it would be known just what work will be undertaken by the Council and therefore what expenses will be necessary. It is suggested that the officers of the Council act as a budget committee and meet after this convention to decide on what assessment should be made. On account of increased volume of work the amount previously expended for clerical assistance should be much larger. A financial statement accompanies this report.

Respectfully submitted,
T. Keith Legaré
Secretary-Treasurer.

Council of State Boards of Engineering Examiners Financial Statement
November 6, 1924 to November 10, 1925

RECEIPTS:	
November 6, 1924, Cash on hand	$30.10
Received from Boards for 1924 assessments as listed	114.80
	$144.90
DISBURSEMENTS:	
Dec. 10, 1924, Printing 500 letterheads and envelopes	$8.00
Feb. 12, 1925, Mimeographing and mailing minutes of fifth convention	12.54
Feb. 24, 1925, Printing 5000 applications and mailing	72.00
Nov. 10, 1925, Postage for year	8.00
Nov. 10, 1925, Mimeographing and mailing notices of sixth convention and list of Boards	8.00
Nov. 10, 1925, Stenographic work Sept., Oct., Nov.	10.40
	$118.94
RESOURCES:	
Cash on hand, Nov. 10, 1925	$ 25.96
LIABILITIES:	
Due Colorado Board, balance of account	$100.00

T. Keith Legaré
Secretary-Treasurer.

Secretary-Treasurer's Report—1926

"To the Members of the Council:

I have the honor to submit the following report for the period from Nov. 10, 1925 to Nov. 10, 1926.

The membership of the Council now consists of eighteen states, as follows: Arizona, Arkansas, Colorado, Florida, Idaho, Indiana, Iowa, Louisiana, Michigan, Minnesota, North Carolina, Oregon, South Carolina, South Dakota, Tennessee, Virginia, West Virginia and Wyoming. All these states have ratified the "Articles of Agreement on Reciprocal Registration." Tennessee, South Dakota, Arkansas and Idaho have become members since our last convention. The only states having registration laws for professional engineers which are not members of the Council, are New York, New Jersey, and Pennsylvania. Hawaii also provides for registration of professional engineers. Illinois requires the registration of structural engineers and California and New Mexico have registration laws for land surveyors but these do not include civil engineers. The Secretary has communicated with all states in which legislation is pending and has reports from the following: Nevada, Washington, Oklahoma, Wisconsin, California, Utah, Georgia, Missouri, Texas, Montana, North Dakota, New Mexico, Alabama and Ohio.

If the volume of correspondence and other work handled by the Secretary's office during the past year can be taken as an indication of the usefulness of the Council or of the interest in its work,

it can be assumed that we have had a very successful year. We have been in constant communication with the various state boards, committees or individuals working on proposed legislation and, with various engineering organizations. The Council is now evidently recognized as an authority on engineering registration and the Secretary's office is rapidly becoming a clearing house for information on this subject. As an example of the territory covered we will mention that in one mail we received letters from Vermont, California, and Florida, followed the next day by Canada, and Texas. The Secretary has promptly furnished all data requested.

Many requests have been received for a recommended form of registration law and it is the opinion of the Secretary that the best work which can be accomplished by the Council at this time is to compile the law suggested at the last convention. This Suggested Uniform Registration Law could be used as a guide by states adopting engineering registration in the future and also by those states which wish to revise their present laws.

There was such a demand for the proceedings of the last convention that the Secretary deemed it advisable to print 200 copies for distribution but regrets that the minutes contained in same were not more accurate. The expenses of the Council have necessarily increased but it is estimated that an assessment of $25.00 for each board will cover all expenses for the coming year. All members of Council paid their assessment for the 1925 and 1926 years. The Council has no accounts payable or receivable and the cash balance on hand is $147.46 as shown by the financial statement, which is a part of this report."

President Daggett: You have heard the report of the Secretary. What is your pleasure? (Upon motion, duly seconded and carried, the report was adopted as read.)

President Daggett: Before we proceed to the reports of the Committees I believe the Secretary has some announcements he would like to make.

Secretary Legaré: We have a little program outlined of what we are going to try and do. At twelve or twelve-thirty I thought we would go to Wannamaker's store. Tonight at seven o'clock we have arranged for a banquet in the Rose Room. Mr. Humphrey invited us this morning to come to the Engineer's Club, but we had made arrangements so we have asked the Philadelphia Engineers to come and join with us tonight.

President Daggett: We have some Committees to report. The first is on the Model Registration Law, and the Secretary, Mr. Legaré, is the chairman of that committee. I will ask him to read the report.

Secretary Legaré: In order not to have so much work to do the chairman passed the buck and appointed Mr. Taylor, who is a member of that committee, as secretary, and he has a written report which he will read for us. I would like to say that this committee met all day yesterday and did a good day's work on Sunday. We were accused of not being in the room, but we certainly were there up until last night.

Explanation By The Secretary—1926

With the idea of having a complete record of the Indianapolis meeting, the Secretary requested the local committee to engage a competent stenographer. Four months after the convention the Secretary received some "notes" but from which it was impossible to prepare accurate minutes of the meeting. However the Secretary did keep copies of the resolutions. The following includes these notes, with corrections; and other data has been added that this report may contain at least some information of value.

The meeting was called to order at 10 a.m. on Nov. 16 by Mr. Martin, the President.

Mr. Martin: Gentlemen, if you will please come to order we will proceed to get down to business. I know none of you are expecting a talk from me at this time, as you know I will do a lot of that later on. Twenty-two states received invitations to this convention, fourteen states are members of the Council and seventeen have sent delegates, and I believe this is the largest convention we have had. I am going to appoint the following committees at this time and they will make their reports later:

Nominations: Mr. Cox, Mr. Taylor and Prof. Tucker.
Resolutions: Mr. Doty, Mr. Pegues and Mr. Headman.
Procedure in Issuing Reciprocity Cards: Mr. Luten, Mr. Taylor and Prof. Daggett.
Work to be Undertaken by the Council: Mr. Hammatt, Mr. True and Mr. Oakes.

You have all received the report of our last meeting and there is no need of the secretary reading that now.

Mr. Mendenhall: Mr. President, there may be some members here who have not received that report.

Mr. Legaré: I will be glad to furnish a copy to any delegate who has not received one.

Mr. Martin: We will now have the report of the Secretary-Treasurer.

The Secretary read his report in which was stated that 5,000 reciprocity application blanks were printed and supplies sent to members of Council and also copies of minutes of the last convention were sent to all states having registration laws. A large amount of correspondence was handled during the year and information furnished to states endeavoring to have registration laws adopted. All assessments for 1924 were promptly paid and a financial statement, which was read showed that cash on hand amounted to $25.96 and that the Colorado Board was still due $100 on a fund advanced to the Council.

The Secretary reported that twenty-two states, not including Hawaii, now have registration laws and that fourteen are members of the National Council, also that it was expected that three other states would join the Council at the next meeting of their boards. Included in this report is a complete list of all boards, both members and non-members of the Council.

Mr. Legaré: Mr. President, that is all of my report except some letters from states that have been trying to pass registration laws. These reports showing progress attained are from California, Georgia, Missouri, Ohio, Oklahoma, Utah, Wisconsin and Washington.

Secretary-Treasurer's Report—1927

I have the honor to submit the following report covering activities of the Council from November, 1926 to November, 1927.

The past year has been an uneventful one in engineering registration as far as the records of the Council show. According to the information reported to us, there have been no new states that have adopted registration laws and no other boards have become members of the Council. The membership of the Council now stands as shown in proceedings of 1926 convention. The outstanding work of the Council for the past year is probably the cooperation secured from the American Society of Civil Engineers in connection with amendments to the Act of Legislation for Registration, recommended by the Society. This and other subjects will be covered by committee reports later.

The Secretary has written to committees and parties interested in proposed legislation in various states and has received reports from the following: California, Missouri, Oklahoma, Utah,

Washington, Ohio, New Mexico, Texas and Montana. It does not seem advisable to give these reports in detail at this time but they are available to any member of the Council interested in same. No serious questions or disagreements have arisen between the members of Council but two or three points of interpretation of Articles of Agreement on reciprocity have been brought up and these will be submitted to the Council for final ruling. The proceedings of Council were printed in booklet form and copies distributed to all delegates, State Boards, and various parties interested in same.

All members of the Council paid their assessment for the year 1927 and a financial statement is submitted herewith which shows a balance of $86.82 cash on hand and no liabilities against the Council.

Respectfully submitted,
T. Keith Legaré,
Secretary-Treasurer.

Secretary-Treasurer's Report—1928

To The Members of The Council:

I have the honor to submit a report for the period from Nov. 10, 1927 to Nov. 10, 1928.

The office of the Secretary has handled only the routine work during the past year and there is really nothing of special interest to report. The membership of the Council remains the same as listed in Proceedings of 1927. Copies of last years proceedings were distributed to all State Boards, delegates, engineering organizations, and other parties interested in engineering registration.

The Secretary has been in communication with the Committees of various states where proposed legislation is pending and has recent reports from the following:

California, Georgia, New Mexico, Nevada, Missouri, Texas, Ohio and Utah.

The President, George E. Taylor, has made a real contribution to the work of the Council in his efforts to secure the cooperation of New York, New Jersey and Pennsylvania by making a personal visit to the members of these Boards, paying his own expenses and giving much of his time.

Assessments for the expenses of the Council for the year 1928 were promptly paid by all Boards and the financial statement submitted herewith shows a cash balance on hand of $156.92 with no liabilities against the Council.

Respectfully submitted,
T. Keith Legaré,
Secretary-Treasurer.

Secretary-Treasurer's Report—1929

(Period Nov. 10, 1928—August 21, 1929)

To The Members of The Council:

I have the honor to submit a report for the period mentioned above.

A few years ago the subject of registration of engineers was being discussed by engineering societies and the profession in general from the standpoint of whether or not registration was advisable or would result in benefit to either the profession or the public, but the movement has made such progress that it is now more a question of selecting the best form of laws and adopting the best methods of procedure in administering these laws.

Since the last convention of the Council two more states have adopted engineering registration laws, these being Mississippi and California. The Mississippi Board has already become a member of the Council and it is expected that the California Board will become a member at this convention. A registration bill was introduced in the Ohio Legislature, but no definite action was secured before adjournment. Other states have committees considering the matter of registration for their states.

All except one of the national engineering societies have committees on the registration of engineers and most of these committees are actively at work. The American Society of Civil Engineers has appointed an entirely new committee, of which your Secretary is a member, with instructions to make a definite report on registration of engineers in the near future. Your Secretary has suggested that committees of other engineering societies and this Council cooperate with the committee of the American Society of Civil Engineers and has received the approval of practically all the Societies. Subjects for discussion at this convention are herewith submitted with the idea of bringing out certain information that will be of value to these committees and members of the Council.

The National Council is being constantly referred to for general information on engineering registration and the Secretary's office has handled much correspondence and data on this subject since the last convention. The printed proceedings of the 1928 convention have been in great demand and a large number were distributed. In order to definitely fix the annual assessment for the general expense of the Council, it is recommended that the State Boards pay an annual membership fee of $50.00. All members of the Council have paid their 1929 assessment and the financial statement submitted herewith, shows a cash balance on hand of $353.87, with which to meet certain expenses for the remainder of this year. All financial claims against the Council to date have been paid.

Members of National Council
August 1929

Arizona
Arkansas
Colorado
Florida
Indiana
Iowa
Louisiana
Michigan
Minnesota
North Carolina
Oregon
South Carolina
South Dakota
Tennessee
Virginia
West Virginia
Wyoming

Not Members of National Council

Hawaii
Idaho
Illinois
New Jersey
New York
Pennsylvania

Secretary-Treasurer's Report—1930
Financial Statement
August 22, 1929 to October 1, 1930

RECEIPTS:

Cash on hand August 21, 1929	$353.87	
Received from Mississippi Board Assessment for 1929	35.00	
Received from twenty State Boards as listed below, assessments for 1930 at $50.00 each	1,000.00	
		$1,388.87

DISBURSEMENTS:

Stenographic Report Convention	$ 50.00	
Printing 1929 Proceedings	142.50	
Convention Expenses	11.81	
Secretary's Salary beginning January 1	225.00	
Clerical Services (14 months)	290.00	
Postage, Telegrams and Office Expense	44.13	
Filing Cabinet	30.00	
Uniform Registration Law Committee	117.36	910.80
		$478.07

RESOURCES:

Cash on hand, October 1, 1930	$478.07

LIABILITIES:

None.

1930 Assessments paid—Arizona, Arkansas, California, Colorado, Florida, Idaho, Indiana, Iowa, Louisiana, Minnesota, Mississippi, North Carolina, Oregon, South Carolina, South Dakota, Tennessee.

Note—Includes all Boards except Michigan.

T. Keith Legaré,
Secretary-Treasurer.

Secretary-Treasurer's Report—1931

Since the last meeting of the Council, one more state, Kansas, has adopted an engineering registration law, making twenty-four states now that have comprehensive laws regulating the practice of engineering. Last year twenty-one state boards were members of the Council. During the year New Jersey and Pennsylvania have joined with reservations as to the Articles of Agreement on Reciprocal Registration, and it is expected that Kansas will join at this meeting. One-half of the states in the Union will be represented in this body.

In three states registration legislation was successful in the legislatures, only to be defeated by vetoes. In Ohio, the Governor vetoed the bill on the grounds, first, that it provided for registration of firms and partnerships, and second, that it provided for a registered engineer on all public works costing more than $500. In Washington, the Governor states that if the necessity for the law was admitted, the bill was too drastic and far-reaching.

In New York the legislature raised the qualifications for registration, while in Oregon an effort to improve the law was killed in the Senate.

On June 22, twenty representatives of national and state engineering societies met in New York City and adopted for the first time a set of definite educational standards for inclusion in the model registration law. The significant thing about these standards is the emphasis placed on an engineering college education. Without working any hardship on the self-educated engineer, the profession has at last set up the educational qualifications necessary to distinguish it from a vocation.

These new standards, of course, have yet to run the gauntlet of the legislative bodies. As the *Engineering News-Record* pointed out in its editorial columns, they "mark a long step in advancing the status of engineers." It is the task of the present generation of engineers to see to it that they become embodied in our statutes in order that in future generations the public as well as the engineers may enjoy the benefits.

It is a pleasure to report that the financial status of the Council is in a flourishing condition, as indicated by the accompanying financial statement.

Respectfully submitted,
P. H. Daggett,
Secretary-Treasurer.

Secretary-Treasurer's Report—1932

Oct. 1, 1931 to Oct. 1, 1932

The adoption of a Model Law for the Registration of Professional Engineers and Land Surveyors and the establishment of a National Bureau of Engineering Registration, two important projects proposed and fostered by this Council, have been the outstanding contributions to the engineering registration movement during the past year. Because of the information and services now available it is expected that engineering registration will make extensive progress in the future, resulting in great benefit to the public and to the engineering profession.

The newly formed Engineers' Council for Professional Development in which the National Council was invited to take part, proposes to develop a program of education and training for the young engineer, which has long been greatly needed by the profession.

The Wisconsin Board of Examiners of Architects and Civil Engineers became a member of the National Council during the past year, making the membership of the Council now 25 State Boards of Registration and representing over 35,000 registered professional engineers.

States in which the registration of engineers is now being actively promoted are Connecticut, Illinois, Ohio, Washington, Delaware, and District of Columbia.

The activities of the Secretary's office during the past year have been chiefly in connection with the Model Registration Law, National Bureau of Engineering Registration, and Engineers Council for Professional Development, to be presented in special reports to the Council and, therefore, will not be further covered here.

This report would not be complete without reference to the valuable services rendered by our distinguished President, Dr. D. B. Steinman, and his efforts in the interest of engineering registration and professional standards will be of lasting benefit not only to this organization, but to the entire engineering profession. It has been a privilege and an inspiration to have been associated with him in the work of the Council during the past year.

Respectfully submitted,
T. Keith Legaré,
Secretary-Treasurer.

Secretary-Treasurer's Report—1933

Oct. 1, 1932 to June 30, 1933

During the past year several thousand registered engineers were unable to renew their registration because of unemployment, however, the total number of registrants in good standing at this time in the twenty-five States which are members of the National Council is 31,533.

At the 1930 Convention of the Council the Michigan Board presented a written protest regarding the qualifications of some engineers to whom certificates of reciprocal registration had been issued by certain States in the name of the Council, this protest resulting in a discussion of this system of reciprocity and suggestions for a new method. The Council subsequently provided for a system of reciprocity in connection with the operation of the Registration Bureau, but much confusion has been caused by the continuation of the old system of reciprocity cards by some States. A total of only 663 reciprocity cards, many of which were never used, has been issued by State Boards during the period of ten years that the Articles of Agreement on Reciprocity have been in force. Those Member Boards which have officially announced that they are not issuing these reciprocity cards represent 74 percent of the total number of registered engineers in the twenty-five States, Members of Council.

The Secretary's office has been in communication with engineering committees and societies in fifteen states where new registration laws are pending, furnished data pertaining to registration and reviewed proposed Acts. These States are as follows: Connecticut, Ohio, Illinois, Missouri, District of Columbia, Maine, Oklahoma, Nebraska, New Mexico, Delaware, New Hampshire, Alabama, Maryland, Georgia, and Utah. It is significant that the Model Registration Law, which was sponsored by the Council, has been used in practically all these States as a basis for proposed legislation. Some letters from those promoting registration laws in these States accompany this report.

In a letter dated March 19, 1921 from the first President of the Council, a member of the Louisiana Board, to the first Secretary of the Council, a member of the Iowa Board, it is stated that ". . . it seems to me that if we are going to make progress towards the goal we all have in mind, which is uniform examination and uniform registration, that it must be done through the agency of the Council," therefore, it is evident that the activities of the Council, such as Model Registration Law, Uniform Examinations for Registration, Accredited Engineering Schools, National Bureau of Engineering Registration, and Engineers' Council for Professional Development, are not only in full accord with the purpose of the Council as set forth in the Constitution, but are also progressive steps toward attainment of the goal visualized by its founders. The time has come when national engineering organizations are no longer assuming the attitude of the ostrich but are working together for the general welfare of the engineering profession.

On May 15, 1933 the Secretary addressed a communication to all members of State Boards calling attention to and recommending certain activities of the Council, therefore, these matters will not be referred to in this report.

Respectfully submitted,
T. Keith Legaré,
Secretary-Treasurer.

Report of Executive Secretary—1934

Due to the large amount of legislation pertaining to finance, relief, and employment, which held the attention of all State legislatures during the past year, no new engineering registration acts were adopted, however, the interest in this subject has been steadily increasing.

An item of interest which has come to the attention of the Secretary is a decree issued by the Federal government of Brazil regulating the practice of engineering.

Ohio and Puerto Rico became Member Boards of the Council since the last annual meeting and the Colorado State Board withdrew membership making the membership at this time consist of twenty-six State Boards.

In October 1930, the Secretary (then President of the Council) presented a paper in which it was suggested that the engineering profession should "adopt minimum requirements for the practice of professional engineering" and "prescribe a formal procedure of education and training for all who would become members of the engineering profession, with definite recognition of such training when it has been acquired." Such a program is now recommended by the Engineers' Council for Professional Development and will be reported on at this meeting.

The efficiency and extent of the work of the Council has been greatly handicapped during the past two years because of limited funds and the fact that the services of the Secretary were only available at irregular periods. It is expected that the newly formed National Society of Professional Engineers will be able to undertake and promote some of the activities which the officers of the Council have recommended for some time.

One of the principal activities of the Council, and one which has required considerable of the Secretary's time, is the Registration Bureau and this will be covered in a separate report.

It is recommended that the unpaid membership fees of State Boards for all years previous to 1934 be declared cancelled, and that, in order to balance the finances of the Council, the sum of $476.50 due the Secretary also be cancelled.

The Secretary wishes to express his appreciation to the Member Boards for their loyalty and financial assistance to the Council, and the Board of Directors for their personal encouragement and guidance.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

(Since above report, Hawaii became a Member Board.)

Report of Executive Secretary—1935

The membership of the National Council of State Boards of Engineering Examiners is now composed of thirty-one (31) State Boards, representing approximately 40,000 registered engineers. Four (4) of the States that have recently adopted registration laws have become members of the Council and it is expected that others will join in the near future.

The status of the legal registration of professional engineers in the United States, as of October 1935, is as follows:

Thirty-five (35) states now have laws governing the practice of professional engineers; they are as follows: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Michigan, Minnesota, Mississippi, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, Washington, West Virginia, Wisconsin and Wyoming. The Illinois law controls the practice of structural engineers only. Hawaii, Puerto Rico and the Philippines also have laws regulating the practice of engineers.

Eight (8) states adopted registration laws in 1935; these were Alabama, Connecticut, Maine, Nevada, New Mexico, Oklahoma, Utah and Washington.

Nine (9) other states introduced engineering registration bills in their State Legislatures in 1935, but they were continued or not passed for various reasons. These States were District of Columbia, Georgia, Illinois, Massachusetts, Missouri, Montana, Nebraska, North Dakota and Texas.

Two (2) other states have had registration bills before their Legislatures: Delaware in 1933 and Kentucky in 1934.

Two (2) states have not introduced bills in their Legislatures but have committees collecting information pertaining to registration; these are Maryland and Rhode Island.

Two (2) states have shown no interest in the registration movement; these are New Hampshire and Vermont.

Most of the new laws, and all except one of the pending laws, were based on the "Model Law;" however, there are changes and omissions in some of them that, in our opinion, may prove objectionable. The extent to which the "Model Law" has been utilized and the recognition given it should be most gratifying to the National Council, American Society of Civil Engineers and other organizations associated with its preparation and adoption.

At the request of and with some assistance from the Secretary, Dean P. H. Daggett, past-president of the Council, has compiled a comprehensive digest of all the thirty-five (35) state laws pertaining to the registration of engineers and deserves the gratitude of the Council for his valuable contribution. This digest was presented as part of the report of the Committee on Professional Recognition to the annual meeting of the Engineers' Council for Professional Development on Oct. 8, 1935, and is also submitted with this report for publication in the Proceedings of the Council.

The Secretary recommended to President Reed the appointment of a Special Committee on Reciprocity and Certification of Engineers in order that a study of these subjects be made in advance of the annual meeting and recommendations submitted that may pave the way for the adoption of a procedure satisfactory to all members of the Council.

The Secretary is of the opinion that the purpose of the Council, as outlined in the Constitution, can best be accomplished through the following activities of the Council:

1. "Uniform administration of the State Engineering Registration Laws:" promoted through the Standing Committees on Uniform Examinations for Registration, Accredited Engineering Schools, and Legal Procedure; the annual meeting at which members of State Boards confer and discuss various problems connected with the administration of their laws; the publication of the Proceedings of the Council; a well-equipped national office to handle promptly correspondence and request for special information, to assist in the activities of committees, and conduct the work of the National Bureau of Engineering Registration.

2. "The facilitating of reciprocal relations between State Boards:" by means of the National Bureau of Engineering Registration, a function of Council established to assist the State Boards in certifying engineers through a uniform system of investigation, verification and a high standard of rating.

3. "Defining and maintaining National Qualifications for Registration," by upholding a high standard for reciprocal registration through the National Bureau of Engineering Registration, by endorsement of the requirements specified in the "Model Registration Law," and by supporting any activities which are in the interest of uniform standards of qualification.

This Council is the logical organization to advise and furnish reliable information to the state groups that are promoting the adoption of new registration laws or amendments to existing laws. After fifteen years of administering registration laws and accumulating data pertaining to requirements, examinations, reciprocity, enforcement, court decisions and numerous details of procedure, the office of the Council is better qualified than any other to make recommendations regarding these matters and what should constitute an adequate registration law. The American Engineering Council, American Society of Civil Engineers, American Society of Mechanical Engineers and others frequently refer to this office the inquiries received by them and the Secretary of the National Council has been in constant communication with individuals and committees in almost every state for several years. It is recommended that some provision be made to develop this activity of the Council in an efficient and extensive manner.

Some members of the Council seem to have the impression that the Council only functions during the annual meeting and do not realize that this feature alone requires considerable attention before and after the meetings; that applications to the Registration Bureau are handled every week; and that mail is received almost daily that requires individual replies. It has been the ambition of the Secretary to see established a central clearing house for all matters pertaining to the registration of engineers, but it has been a difficult task for his office to render very satisfactory service with a part-time secretary, a part-time stenographer, and such a limited budget.

The Secretary wishes to express his appreciation for the cordial cooperation given him during the past year by all the officers and members of the Council.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

Report of Executive Secretary—1936

The membership of the National Council of State Boards of Engineering Examiners consists of thirty-five (35) legally constituted State Boards which have a total of over 45,000 registered engineers and surveyors; therefore, the Council is the official national organization of the largest group of legally recognized professional engineers in the country, probably in the world. Since our last meeting four State Boards have joined the Council: Maine, Nevada, Washington and Alabama.

This has been an off year for meetings of State Legislatures and no new registration laws have been passed. A registration bill was introduced in the Kentucky Legislature but due to opposition that developed was not passed and cannot be taken up again until 1938. It is expected that a number of states will adopt the legal registration of engineers next year. Several committees are in communication with the Secretary regarding pending legislation and those in Missouri, Delaware, and Nebraska have already submitted for review and suggestions the proposed laws which they intend presenting to their Legislatures in January, 1937.

The improved business conditions have created more interest in the services available through the Registration Bureau conducted by the Council and the number of applicants will probably increase in the future. The report of the Committee on National Bureau of Engineering Registration will give further details as to this function of the Council.

The Dominion Council of the Associations of Professional Engineering of Canada was organized in February, 1936, but the details of the membership and financing have not been completed and therefore the Dominion Council is not yet functioning.

The activities proposed are very similar to the objectives of the National Council and are outlined as follows:

(a) To assist the Provincial Associations in securing improved legislation for the better protection and regulation of local professional interests.

(b) To secure the adoption by Provincial Associations of uniform standards of examination and membership.

(c) To arrange for reciprocal privileges between Provincial Associations for the benefit of their members.

(d) To secure harmony of action in all matters affecting common interest, and generally to act in an advisory coordinating capacity to the Provincial Association.

(e) To negotiate with other organizations whereby the common interests of the engineering profession would be advanced.

The Secretary, as one of the representatives of the National Council, attended the annual meeting of E.C.P.D. which was held in New York City on Oct. 6, 1936. The reports of the E.C.P.D. Committee and the Committee on Accredited Engineering Schools cover the activities of the E.C.P.D. of which the National Council is a participating member.

The Council through its Secretary was consulted in connection with the Cuban Decree-Law No. 744 which provides for the regulation of the practice of engineering in that Country and was approved April 3, 1936. This Decree-Law, as first proposed, limited the practice of engineering in Cuba to Cuban citizens only but now contains the following provision on reciprocity. "Engineers who are citizens of sovereign states, or of states, dominions or colonies with their own legislation, which do not therein require Cubans to be citizens of that country in order to practice the profession of engineer, shall enjoy in Cuba the right of reciprocity, being exempt from the provisions of the first paragraph of this section." (To be a Cuban citizen.)

A new map has been prepared by the Secretary showing the status of the registration of engineers. This map is submitted as a part of this report and will be printed in the Proceedings. Additional copies of the map will be available for distribution to committees who are promoting new registration laws.

It is recommended that the annual meeting of the Council be rotated among the four Zones into which the Member States are divided and that the next three meetings be held as follows: 1937 in Northeast Zone, 1938 in Central Zone, and 1939 in Western Zone.

In the last report, the Secretary's recommendations for the future development of the activities of the Council were given in detail; therefore, reference is not again made to these matters.

The Secretary is very grateful for the encouraging interest shown by Member Boards and national engineering groups in the efforts of the Council to coordinate the activities connected with the registration of engineers.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

Report of Executive Secretary—1937

The National Council of State Boards of Engineering Examiners now has a membership of thirty-eight (38) legally constituted State Boards of Engineering Examiners, or Registration, and these Boards have a total of approximately 53,000 registered professional engineers and land surveyors. The number of registrants recently reported by the Member Boards is as follows: engineers, 46,812; surveyors, 6,198; and non-resident engineers which are included in the above, 3,328. As

there is some duplication in the non-resident engineers and as the number in good standing in all states is constantly changing, the exact number of registrants cannot be given.

During the past year Georgia, Nebraska and Texas adopted registration laws and the Boards of these States have become members of the National Council.

Thirty-eight (38) states, including Illinois which registers only structural engineers, now require the legal registration of professional engineers. In addition to these Hawaii and Puerto Rico also have laws regulating the practice of engineering. The ten states and the District of Columbia, which have not yet adopted the registration of engineers, have all shown some interest in promoting such legislation in their states and there is no doubt that several more will be added to the registration group in the near future. Bills providing for the registration of engineers were introduced in several of the State Legislatures in 1937, but for various reasons were not passed. In most cases the bills were crowded out by other legislation and carried over by committees to the next session. In a few instances the bills were defeated because of opposition from certain groups. The Secretary has recently received communications from all of these states, except Montana, and it is evident that there are active registration committees in most of these states.

The Secretary's office has mailed direct to every member of each State Board, Committees in states with pending laws, officers of national engineering societies and others interested in registration, copies of the following: Proceedings and Year Book of the National Council, an address "The Philosophy of Professional Licensure," the revised Model Registration Law, memorandum regarding the Registration Bureau, convention announcements, and various communications. We have had the privilege of rendering some service to the new Registration Boards which were recently organized and have also been in constant communication with committees in charge of pending registration laws.

President J. S. Dodds paid an official visit to the office of the National Council in Columbia, South Carolina, on May 15 and made a first-hand inspection of the location and facilities of our headquarters. The Council was also honored during the past year with a personal visit to its headquarters by Mr. Louis C. Hill, President of the American Society of Civil Engineers.

The report of the Registration Bureau, one of the principal activities of the Council, will be covered in the report of the Committee on National Bureau of Engineering Registration.

The finances of the Council are in better condition than ever before in its history. Due to the increase in membership fees and the generous contribution from the American Society of Civil Engineers, we have been able to extend some of the work of the National Council, to meet all of our obligations promptly, and to end our fiscal year with a much needed surplus. The cash balance on hand will enable us to operate on a cash basis during the next three months, whereas here-to-fore we have been without funds during the period when our expenditures are the greatest and there is practically no income from membership fees. If the Council is to be operated efficiently in the future such a surplus at the beginning of the fiscal year will always be required.

We understand that President Dodds is to report on the purposes and activities of the Council in his annual address, therefore, further reference to these matters are omitted in this report.

The Secretary gratefully acknowledges the unfailing cooperation received from all Member Boards and national engineering societies, and also wishes to express his appreciation for the helpful guidance given by the President and other officers of the Council.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

Report of Executive Secretary—1938

The National Council of State Boards of Engineering Examiners is now composed of forty legally constituted Boards of Registration for Professional Engineers which have a total of approximately 60,000 registered engineers and land surveyors. The number of registrants in each state is shown in the accompanying tabulation.

During the past year Rhode Island and Kentucky adopted engineering registration laws and are now members of the National Council. Colorado and Illinois are the only states, with laws requiring the registration of engineers, that are not members of the National Council.

There are now eight states, and the District of Columbia, which do not require the legal registration of professional engineers and several of these are promoting such legislation. Missouri has a very active committee which expects to secure a registration law in 1939. New Jersey has adopted an entirely new registration law which is based on the Model Law and contains a special feature of interest, namely, the requirements for registration provide that a Certificate of Qualification, issued by the National Bureau of Engineering Registration, may be accepted as minimum evidence satisfactory to the Board that the applicant is qualified for license as a professional engineer.

The National Council was incorporated as an eleemosynary organization in the State of South Carolina on March 28, 1938, in accordance with action taken by the Board of Directors.

In order that the members of the Council might have some definite information regarding some of the work in the office of the Council an actual record was kept last year of incoming and outgoing mail pertaining to business of the Council. The mail received was 3,459 pieces and the mail sent out was 5,185 pieces, amounting to a total of 8,644 pieces of mail handled in this office.

On July 16, 1938, the Secretary met with the Colorado Board in Denver and was given a very courteous reception. It is sincerely hoped that Colorado will be represented at this meeting and will return to membership in the Council.

In connection with the Summer Convention of the American Society of Civil Engineers in Salt Lake City, Utah, on July 20, 1938, an informal and unofficial luncheon conference of members of State Boards was held. The work of some of the committees of the Council and other matters of interest were discussed briefly.

Many of the State Boards have published in their annual reports the Bulletin of Information of the National Bureau of Engineering Registration and other information pertaining to the National Council. This has been very helpful in creating a better understanding of the purpose of the Bureau and the Council. It is hoped that all Member Boards will eventually cooperate in this manner as it is for the best interest of the registrants in each state that they be correctly informed regarding the Council.

Splendid cooperation has been given the Council and Bureau during the past year by engineering colleges, engineering societies, employers and individual engineers, as well as Member Boards.

One principal activity of the Council's office is covered by the report of the Committee on National Bureau of Engineering Registration which will be submitted later at the Convention.

Accompanying this report, as supplements thereto, is the financial statement and audit, financial statement for past fifteen years; tabulation of 1938 membership fees, paid and due; tabulation of registrants in each state; chart showing progress of registration laws; map showing status of registration in the United States; and list of all members of each State Board. (Refer to 1938 PROCEEDINGS).

An article with the title "The States Put Their Heads Together" was recently published in the *Readers' Digest* from which the following is quoted: "One outstanding weakness in our system of government is our legal 'No Man's Land,' the area in which federal authority does not operate but where no single state can act effectively. . . . But fortunately there is an alternative—combined action by the states wherever their interests are common. And workable machinery for this cooperation has already been created." This seems a good description of the place filled by the Council in connection with the legal registration of engineers.

It has never been advocated by the Secretary, or anyone he knows of, that the Council be made "a powerful central organization . . . imposing or coercing from the outside, either as to details of the conduct of their (State Boards) business or as to standards that they shall follow" but the records show it has been repeatedly recommended that the Council be developed as an advisory and coordinating body only, serving as a national clearing house and contact agency for State Boards of Registration and registered engineers.

The Council can never attain its maximum usefulness and efficiency when there exists an undercurrent of agitation causing misunderstanding between Member Boards and individuals. No organization can be fully successful without tolerance, unselfish service and whole-hearted cooperation on the part of its members.

In the interest of a more harmonious understanding of the purpose and policy of the Council, the Secretary requested President Graf to appoint a special Committee on Activities and Finances to consider certain questions. This Committee will submit its report at this Convention and it is hoped that clear-cut statements will be adopted by the Council as a result of these recommendations.

The history of the Council is to be reviewed at this meeting so the Secretary, who has attended seventeen consecutive meetings of the Council and has served in an official capacity for fifteen years, wishes to add a few personal words in closing this report. It has not been possible to conform with the ideas of all members of the Council, representing as they do not only widely separated sections of the country but sometimes opposite viewpoints. Because of his enthusiastic belief in the definite value and usefulness of the National Council, the Registration Bureau and the Model Law, the Secretary has probably been somewhat aggressive and outspoken at times. Therefore, to all of you who have given your loyal support during the past years, he wishes to express his sincere gratitude for your patience and cooperation.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

Report of Executive Secretary—1939

1. The *National Council of State Boards of Engineering Examinations has* 41 *Member Boards*, which are the legally constituted State Boards for the registration of professional engineers of the various states and of Hawaii and Puerto Rico. *Maryland* and *Vermont* have recently adopted engineering registration laws. Vermont has already joined the Council and Maryland is expected to become a member in the near future. *Colorado* and *Illinois* are *not members* of the Council.

2. *The six states which do not have registration laws* regulating the practice of professional engineering are Delaware, Massachusetts, Missouri, Montana, New Hampshire and North Dakota and also the District of Columbia. Missouri, Delaware and the District of Columbia have registration bills pending. *Illinois* also has a proposed bill, providing for the registration of all classifications of

engineers. The engineering societies in *Massachusetts* are making a study of the Model Registration Law. *Alaska* has appointed a committee to investigate the registration of engineers. *Idaho* has adopted a new registration law, which creates a separate State Board to administer the registration law instead of a state department. Several other states have amendments to their registration laws under consideration.

3. A *new "Draft of Model Law* for Registration of Professional Engineers and Land Surveyors" was issued by the American Institute of Electrical Engineers on June 1, 1939, and was approved by its Board of Directors on June 27, 1939.

4. The office of the Council was honored during January with a *visit by* Dr. Henry E. Riggs, at that time *President of the American Society of Civil Engineers*.

5. Attention is directed to the material cooperation of the *American Society of Civil Engineers* which made a *contribution* of $500 to the general fund of the Council, and is appointing *State Committees on Registration* of Engineers.

6. The *death of Colonel Paul Doty*, past President of the National Council, is recorded with deep regret. Colonel Doty was awarded a Distinguished Service Certificate by the Council at its meeting in October 1938, less than two months before his death.

7. A *conference* of those interested in the registration of engineers was held in *New York City* on January 19 under the leadership of President Scott and "A Proposal to ascertain the present 'Standards' of 'Professional Recognition'" was presented by him. The results of this interesting meeting will be reported by President Scott.

8. The Secretary attended a *meeting* of the *Georgia State Board* of Registration for Professional Engineers and Surveyors on May 19 and wishes that he could have the privilege of attending more such meetings with other Member Boards of Council.

9. A pamphlet, containing the article *"What is Engineering Experience"* by Dr. Scott, was published and distributed by the Council. The Secretary has given out several hundred copies of this valuable paper to young engineers at student conferences and similar meetings.

10. The *correspondence* handled by the *office of the Council* has increased 6.5 percent during the past ten months, according to an actual record of mail. This has included several communications with foreign countries, some of which have been at the request of the American Engineering Council and Foreign Embassies in Washington.

11. The activities of the *National Bureau of Engineering Registration*, one of the functions of the National Council, are covered in a separate report.

12. This meeting is being held several weeks before the close *of the fiscal year* of the Council and before certain records are available, therefore, the 1939 *Proceedings and Year Book* will contain a *financial statement* as of *August* 31, 1939, with audit of *Certified Public Accountant*; a tabulation of the *number of registrants* in each state; a *new list of members of State Boards*; a revised *registration map*; and other data. The accompanying financial statement, as of July 5 is presented at this time for the information of the Board of Directors and Council.

13. If the Council approves the plan, the Secretary intends to compile and publish quarterly a *news bulletin for the Council*. Such a bulletin will provide the means for distributing to Member Boards, and others interested, the current news pertaining to the registration of engineers, such as legal decisions, amendments to registration laws, new laws adopted, and special reports from Member Boards and the committees of Council.

14. The Council adopted several years ago the plan of *rotating the annual meetings* among the four Zones. The Secretary now recommends that the *office of President be rotated* in the same manner and that the President be elected each year from a state in the Zone in which the next annual meeting is to be held. This will enable the President to take a more active part in the arrangements for the meeting which would then be in his section of the Country, and will probably result in better attendance from neighboring states. The Council is apparently following the custom, used by many other organizations, of *advancing the Vice-President* to the office of President and this actually results in selecting the next President a year in advance. It is recommended, therefore, that the Vice-President elected at this meeting be from a state in the Northeast Zone, at the 1940 meeting the Vice-President elected be from the Central Zone, at the 1941 meeting the Vice-President elected be from the Western Zone, and so on.

15. It has been an inspiration to serve with our distinguished President, Dr. Charles F. Scott, and due largely to his influence and example, there is evidently developing among Council members that spirit of *understanding and helpfulness* which is so necessary if the Council is to serve its true purpose. The *Secretary* hereby *expresses* his sincere *appreciation* for the support and cooperation of President Scott, the other Officers and all Member Boards.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

Report of Executive Secretary—1940

1. The work of the Secretary's office and other activities of the National Council could be more extensive and more valuable, however, it is not always possible to conduct the affairs of the Council in the most efficient and desirable manner while operating with limited funds and a part-time Secretary. It is necessary in many cases that economy of time and money be the governing factor, and due consideration must be given to the results accomplished with the means available. The total amount expended by the Council during the past twenty years is $31,685.61, which is an average of only $1,584.00 per year. President Polk has called attention to the fact that the amount received by the Council from membership fees is at the rate of 4½ cents per registrant. In this connection it might be interesting to know that the assessment for the budget of the Dominion Council of Professional Engineers in Canada is based on 45 cents per capita.

2. The present membership of the Council consists of 43 legally constituted Boards of Registration for Professional Engineers, which have a total appointed membership of 233. These Member Boards represent a total of approximately 68,000 registrants. Illinois, with a law which applies to structural engineers only, is the only state having a registration law that is not a member of the National Council, and its Department of Registration and Education requested authority to join the Council but was advised that it could not legally do so. At the request of the Department of Registration the proposed new registration law for Illinois provides for membership in the Council.

3. Maryland became a member of the National Council since the last Convention. The Colorado Board was one of the group that organized the National Council, however, for several years it had not been a member. Authority was recently granted by the Colorado Executive Council for the Board to pay its membership fee to the National Council, therefore, the Colorado Board rejoined the Council in April 1940. Everyone is gratified that Colorado is again in the Council.

4. The status of pending legislation in the non-registration states is as follows:

Massachusetts—A committee of Engineering Societies of New England has prepared a permissive or voluntary registration Act for the State of Massachusetts. It is expected that this will be introduced at the next session of the State Legislature. The committee states that it would probably not be possible to enact a compulsory registration law, therefore, the proposed permissive law is being recommended so that Massachusetts may join the registration states.

Missouri—The Missouri Society of Professional Engineers has prepared a registration bill for the State of Missouri. In the opinion of the Secretary, there are several objectionable features in the present draft of this proposed bill. An active campaign will probably be conducted for the passage of a registration bill at the next meeting of the Missouri Legislature and it is believed that a satisfactory law will be adopted.

Delaware—A new bill will be presented to the Delaware State Legislature in January 1941 and it is anticipated that it will be passed. Such a registration law was rejected by the Senate last year by a vote of eight to seven.

New Hampshire—There is no activity at present but it is expected that an effort may be made to pass a registration bill at the next session of the Legislature, which begins in January 1941. The engineers opposed an architects law at the last session of the Legislature as it restricted the activities of engineers.

North Dakota—In May an active engineering society was organized and one of the main topics of discussion was a proposal for a registration law for professional engineers. Another meeting of the society will be held this Fall and it is believed that a registration law patterned after the Model Law will be presented to the Legislature at its next meeting.

Montana—The Montana Society of Engineers is reported as being opposed to a registration law in that State and there is no organized movement at present for such a law, however, a prominent engineer in that State advises that he is planning to have a bill based on the Model Law introduced at the next session of the State Legislature.

District of Columbia—A bill providing for the registration of professional engineers in the District of Columbia has been pending in Congress for some time. Certain interests raised objections to the bill and proposed modifications which would make it useless and, since the committee in charge of this legislation would not agree to the proposed amendments, the bill was not favorably reported out by the House of Representatives Committee for the District of Columbia.

5. New registration laws or amendments to existing laws are being promoted for the following states:

Illinois—The Committee on Legislation of the Illinois Engineering Council has prepared a bill providing for the registration of all classifications of engineers. This proposed bill has several unusual features, some of which are objectionable, but it is claimed that this is the only form of legislation that can be agreed upon at this time by all parties concerned.

California—A proposed "Engineering Profession Act" has been prepared under the auspices of the Los Angeles Engineering Council by representatives of the mining, mechanical, electrical, chemical and civil engineers in California. The fundamental principle on which the proposed Act is based is that the engineers shall govern themselves. A corporation with the governing body elected by the engineers

has been suggested. The Engineering Profession Act of the Province of British Columbia and other Canadian Provinces are based on a similar self-governing corporation. This is a new type of registration law for the United States and will be studied with much interest by the engineering profession in the various states.

South Carolina—The South Carolina Society of Engineers has prepared a revised registration bill as a substitute for the existing law, adopted in 1922. This amended law, which is based entirely on the approved Model Law with some additions, will be presented to the State Legislature in the early part of 1941.

6. During the past year the headquarters of the Council were visited by President A. C. Polk, who spent some time in a careful inspection of the facilities and methods employed at the office. Visits were also made by Mr. Rightor and Mr. Svensen of the Texas Board and Colonel Myers of the Pennsylvania Board.

7. The Secretary attended a conference of Secretaries of Engineering Societies in Washington, D.C., in January and presented a paper on the "Legal Registration of Professional Engineers," which was later revised and published in "Civil Engineering" and reprinted in "American Engineer."

8. The correspondence and routine work of the Secretary's office has steadily increased and a total of about 15,000 pieces of mail has been handled since the last meeting of the Council.

The National Bureau of Engineering Registration, one of the activities handled in the Secretary's office, is reported in a separate report.

With clerical assistance, the Secretary has started a tabulation of the requirements and general provisions of all state registration laws and expects to have this completed for publication in the next *Proceedings* and *Year Book* of Council.

Five quarterly issues of *The Registration Bulletin* have been published and very favorable comments have been received as to its value. The *Bulletin* has been sent gratis to a mailing list of over 850. Very little assistance has been received by the Secretary in connection with contributions for *The Registration Bulletin* and a statement published in the first issue of the *Bulletin* is therefore repeated. "The success and value of the Council's *Bulletin* will depend upon the cooperation and assistance received from Member Boards and their Secretaries, individual members of State Boards, engineering societies and others. Short articles or news notes pertaining to any subject connected with the legal registration of professional engineers are hereby requested and earnestly solicited."

9. Financial contributions have been received by the Council from the American Society of Civil Engineers in the amount of $500.00 and from the National Society of Professional Engineers in the amount of $100.00. Full cooperation and assistance has also been received from these organizations in many ways. The Committee on Registration of the American Society of Mechanical Engineers has prepared a most excellent report of registration, with several progressive recommendations.

10. The National Council has contributed the amount of $500.00 to the work of the Engineers' Council for Professional Development through individual contributions from the following states: Texas, $100.00; North Carolina, $50.00; Connecticut, $100.00; Louisiana, $50.00; Florida, $50.00; Minnesota, $20.00; New Mexico, $12.80; Wyoming, $25.00; Hawaii, $25.00; Minnesota, $25.00; South Carolina, $7.35; Kansas, $50.00; and Maine, $10.00. (There was a collection charge of 15 cents on one of the checks.) Contributions toward the E.C.P.D. fund for the current fiscal year have already been received as follows: Alabama, $50.00; and Texas, $25.00.

11. A financial statement with audit of a Certified Public Accountant accompanies this report. A tabulation showing the number of registrants in each state; a map of the United States, indicating the states having registration laws and showing the boundary lines of Zones into which the membership of the Council is divided; and a list of names and addresses of all members and Secretaries of State Boards also accompany this report and are a part thereof. (Refer to 1940 PROCEEDINGS).

12. The Secretary has carefully reviewed the Constitution and By-Laws and a preprint of the revised draft was mailed to every Member Board with the statement that this revised Constitution and By-Laws would be considered at this meeting.

13. The Secretary respectfully submits the following recommendations for consideration of the Council:

a. The duties originally prescribed for the Committee on Accredited Engineering Schools now seems inappropriate as this activity is being handled by the E.C.P.D. It is, therefore, recommended that the Committee on Accredited Engineering Schools be discontinued and that the Council Committee on E.C.P.D. be assigned any matters in connection with the accrediting of engineering schools. This Committee is omitted in the revised By-Laws.

b. It is recommended that a committee be created to be known as the Committee on Interstate Registration, consisting of eight members, this Committee to take the place of the temporary Committee on Reciprocity. Provision for this committee is included in the revised By-Laws.

c. It is recommended that the National Society of Professional Engineers be invited to appoint a representative on the Advisory Board of the National Bureau of Engineering Registration.

d. In order that all funds derived from fees paid by engineers and surveyors for legal registration and renewal be expended only for a state or national activity or purpose connected with the registration of engineers, at the discretion of the Board or Department having charge of the administration of the state registration or license law for engineers and surveyors in each state, it is recommended that all state engineering societies and local sections of national engineering societies be urged to promote appropriate action in their state that will result in full control of these funds by the said Board or Department.

e. It is recommended that the 1941 Annual Convention of the Council be held in New York City, Oct. 27–30, 1941, with some sessions at the Engineering Societies Building if practicable, and that the officers of the following organizations be invited to participate: all national engineering societies, the Engineers' Council for Professional Development, the Dominion Council of Professional Engineers, the Engineering Institute of Canada, and the New York State Society of Professional Engineers. It is also suggested that a joint meeting of committees on registration of A.S.C.E., A.S.M.E., and other national societies, be proposed for the same time.

f. It is suggested to the President and Board of Directors that a representative of every Member Board of the Council be appointed on some standing committee of the Council and that each committee chairman be authorized to appoint, in addition to his committee members, associate members who are especially qualified for or interested in the work of his committee.

14. The Secretary is very grateful for the helpful support given by the Board of Directors, Member Boards, and national engineering societies, and especially for the sympathetic guidance of President Polk.

Respectfully submitted,
T. Keith Legaré,
Executive Secretary.

President's Report—1941
Virgil M. Palmer

This is the Twenty-second Annual Meeting of our Council. We now have forty-four Member Boards. Delaware we welcome as our newest member, and California is again with us. Last year we became of age. There are now some 70,000 registered professional engineers.

The By-Laws of our Council require "a report of the activities during the term of his office" from the President.

The work of the Council is really performed in two parts. They are not definitely separated one from the other, but they intertwine.

First: There is the splendid work done by our various committees.

Second: There is the equally valuable consistent, day-by-day work of our unusually efficient and veteran secretary. This second division includes correspondence with and follow up of the work of the various committees.

Last year, you will recall a committee procedure was set up with a time schedule, which if followed, should prevent as far as possible last minute rush.

The activities and accomplishments of our various committees are covered by their reports which come later during the meeting. The underlying binding thread of day-by-day work, including a report on the progress of registration legislation and our financial standing are very properly covered, through custom, in the Secretary's report. Duplication is undesirable. I shall therefore confine myself largely in my report to matters of policy or of a general character.

The Purpose of N.C.S.B.E.E.

The purpose of Council is to "promote the public welfare by improving professional engineering standards through efficient administration of state engineering registration laws, by facilitating interstate registration of engineers, and by defining and maintaining national qualifications for registration." The functions of Council are accomplished with no executive power to influence legislation and with no control over its forty-four constituent Member Boards. It is an entirely voluntary association. It can merely give information, facts and advice or counsel when requested.

Advice or counsel is not of much value unless it has one quality. It must be competent—competent counsel. The information and facts to be valuable must be and have been

a. Accurate and well defined.
b. Timely and available when required.
c. Simple and easily understood.
d. Adequate and complete.

The Digest of State Laws Governing the Practice of Professional Engineering and Land Surveying, as authorized last year and recently issued, is a splendid example of the kind of information the Council makes available. This collects and tabulates for the first time the various requirements for registration in the different states. It visualizes differences and provides a basis for

steps seeking maximum practical uniformity of registration requirements. There is yet to be perfected an effective means of securing amendments necessary for this uniformity.

The advice of competent counsel which has been valuable in promoting public welfare is the resultant of the accumulated years of thought and experience of past and present registration board members pooled and made available through our Council. Pooled experience and competent counsel, no matter how good, is ineffective if its availability is not known, if its fine quality is not appreciated, if it is not sought and obtained and used, or if the action of use is not vigorous and well supported. The director of public works of a large eastern city once told me that no matter how well he did his job, if he failed to get knowledge and appreciation of the fact over to the average citizen, he had failed. There must be showmanship and advertising of accomplishment, as well as the ability to accomplish. It pays to advertise, or advertising would not be a $1,660,000,000 a year business.

Our Annual Proceedings, and our quarterly Registration Bulletin started under Past President Polk, record the effective results of the services given by our various committees, but this is not enough. It is insufficient just to have ability and do good work. Knowledge of the good should be spread far and wide. The Poet's story of the better mousetrap and the beaten path to the house door may be all right within the word-to-mouth confines of a small community, but it is not true beyond the village boundaries. Knowledge that better professional standards and better administration of registration laws and increased public welfare may result from N.C.S.B.E.E.'s actions and counsel needs to be spread from Coast to Coast, yes, even out into the far reaches of the Pacific and north of the Border. The work of our Council need far wider and better advertising.

National Council's Work and How Carried Out

As I stated at the beginning, Council's work is carried out by its committees and by Secretary Legaré and his staff. There are now six standing committees as follows:

1. Committee on Interstate Registration.
2. Committee on Qualifications for Registration with sub-committees.
   a. Sub-Committee on Written Examinations.
   b. Sub-Committee on Interviews and Oral Examinations.
   c. Sub-Committee on Qualifying Experience.
3. Committee on Legal Procedure.
4. Committee on National Bureau of Engineering Registration.
5. Committee on Engineers' Council for Professional Development.
6. Committee on Constitution.

Then we have two special committees appointed at our last meeting:

1. Committee on Effects of Registration.
2. Committee on Supplementary Finances.

The reports of these committees come later and they will be published as is customary in our Proceedings.

Regarding the work of these committees, I offer the following comment:

Committee on Interstate Registration

Interstate Registration, as you know, is a new committee set up last year when the Committee on Accredited Engineering Schools was discontinued. The accrediting of engineering curricula is now done by E.C.P D., of which we are a part and on which we are represented by our Committee on E.C.P.D.

Interstate registration became an increasingly important matter with the advent of the huge new Defense projects under construction. These have caused the dislocation of great numbers of

professional engineers from their home states and their engagement on engineering projects in new states where new registration is required. We may also anticipate that these shifts in location in normal times will increase.

Committee on Qualifications for Registration

Qualifications for registration are now set up with clarity and completeness which will be a great help to any board, old or new. There remains the need for further evolutionary development of registration law and procedure which will bring actual practice in step with the high standards outlined and defined. I feel in our knowledge of what to do we are way ahead of our ability to convince as to what should be done, and further yet, ahead of our ability to get it done. Last year, Secretary Seabury of A.S.C.E. pointed out the need for suggestions on how best to promote changes in state laws to get uniformity. Such uniformity will remove one of the big barriers to interstate registration.

Committee on Legal Procedure

Before the status of any profession is definitely and firmly established legally, there must be a backlog of trial cases and judicial decisions which provide precedent and define status. Such decisions give acceptance to definitions and confirm board powers. The registration of Professional Engineers is very new as professions go, but already our Legal Committee has accumulated a surprising amount of material. Here again, I have been concerned to assure effective use of the available material. I have suggested that it be published in the Registration Bulletin and then be clipped out and filed with the Digest of State Laws Governing the Practice of Professional Engineers and Land Surveyors. Thus, there will be accumulated an up-to-date file of legal opinion and precedent.

In connection with legal procedure, there is one practice which is very valuable and which is undoubtedly followed by all of the boards. This is to pick and try in the early days of registration only cases where there is no question as to the merits of the points at issue and avoid or postpone all doubtful cases. This will prove out the ground and establish the backlog of judicial decision before mentioned. After this, less sure issues may be tried.

Legal procedure brings up the question of Ethics. E.C.P.D. is hard at work on "Canons of Ethics," and over the past year there has been much attention, thought and correspondence on this subject. As now, there is no universal oath for engineers, such as the Hippocratic oath for doctors. Many engineering branches have a code for their supposed individual needs, such as those of A.S.C.E., A.S.M.E., A.I.E.E., A.I. Chem. E., Time and Motion Study Engineers, etc. It seems increasingly evident that ultimately registration should be unrestricted as to class or branch as it is according to our Digest in twenty-six states, and that a short, easily understood code of ethics could and should be universal. It could then have supplemental amplifications for engineering branch applications as necessary. Five states have subscription to a code of ethics as a part of registration procedure, I understand. I see no reason why such practice cannot be extended, but prosecution for code violation is a distinctly different matter.

Committee on National Bureau of Engineering Registration

Correspondence during the year indicates the procedure and discerning care taken in checking applicants' records and qualifications and the high standards maintained is not known and appreciated. Our Committee's report will bring these points out. At the same time it seems evident that National Bureau's required qualifications must be made equal to or higher than those of the most exacting state, if certification by the Bureau is to be universally recognized.

Another matter which would probably come under this Committee is that of the proposed enrollment of junior engineers. "Recording as Engineers in Training," our Canadian brothers call it.

Correspondence I have received points out:

1. That there is planned guidance and direction of the student continuously up to graduation and then he is put on his own.

2. That at work after graduation, the young engineer too frequently gets into routine work or work that does not use and properly develop his training and skill.

3. That few employers have an organized guidance and development program for their engineers.

4. That a feeling of frustration and resentment or helplessness frequently results, making such men susceptible to exploitation by organized groups.

The older professions of medicine and law have well developed induction systems which can well be studied. It has also been proposed that in states where examinations are required, the examinations in theory be given by the state boards immediately after graduation, leaving only the examination in practice to be taken after the required period of maturing practice.

Committee on Engineers' Council for Professional Development

Professional development is of course the direct problem of the E.C.P.D. and I know they are keenly aware of the problem, along with the many with which they have to cope. Since neither E.C.P.D. nor our Council are profit-making institutions, and we are a part of E.C.P.D., you received in May a request for contributions to support this very valuable and difficult work.

Committee on Constitution

Notice of consideration of an amendment changing our scale of dues has been sent you. Last year it was pointed out that the dues from membership in Council did not keep pace with the increased demand for, and opportunity to, serve our Member Boards, our profession and the public. A new scale of dues proportional upon the number of professional engineers registered in the different states was discussed and submitted as a guide for dues payments. This comes up for action during this meeting. It is a ticklish subject. There is no definite yardstick for measurement of value received from membership in Council. Need of service and counsel is not proportional to the number of registrants, age of registration laws, or any other known factor. Present financial ability to pay is not a safe measure. Restrictions on board disbursements in some states are severe; in others less so. One state, now happily back with us, suffered such restriction that she temporarily withdrew. She was not alone in her difficulty. Our new scale should be so handled that there need be no repetition of this experience. Dues to Council, it seems to me, should be regarded like contributions to any worthy cause and should not be based entirely on the amount paid by others.

Committee on Effects of Registration

Our financial needs lead to the consideration of the service we render and this in turn to the conclusion that the effects of registration are insufficiently defined, known and realized. Many are sure that registration is having a profound effect upon our profession, but too few realized this and it could not be proved. This led to the appointment of our first special committee, that on the Effect of Registration.

In a recent letter, Past President Graf wrote me that the increase in industrial accidents in connection with the rush of construction and other preparations for Defense production in his state was simply appalling. Projects had been developed and organized so rapidly and the number of

properly qualified men was so limited, that not much attention had been paid to the legal requirements of registration. The accident record, in view of the conditions, appears to be significant.

Committee on Supplementary Finances

Last year, President Polk pointed out the meager size of our budget in relation to the value of Council's service, the amount of work required, and particularly the opportunity to extend the service. The comparison of income from dues to the financial needs of a broadened, more valuable service showed the need of income from supplemental sources. Already we are getting financial support from several engineering sources. This support was increased and it is being continued. Acknowledgment is made of it in a separate report. It was, however, not enough for our needs, and so our second special committee, that on Supplementary Finances, was appointed.

Last year it was moved to have reference made to National Council in the yearly state roster of professional engineers, and to reproduce the U.S. map showing states requiring registration and the graph showing the progress of registration legislation. Some states were already following this practice. I am unaware how far this recommendation has been followed out, but I have seen it well done in the rosters of Texas, New Mexico, Maine, and Oklahoma.

The practice of exchange of state rosters has been called to my attention and I commend it to you. Inspection of several rosters impressed me with the care, experience and attention that is given to registration and its far reaching importance.

In accepting office last year, I tried to give every member of Council something to do. After all, this is your Council and you get out in proportion to what you put in. Strength comes only through exercise. Committee reports this year, I know, will reflect increased effort from increased membership.

Colonel Polk chose a policy of concentration on definite goals for greater accomplishment. This policy I have continued. He pointed out the opportunities for professional engineering accomplishment which lie ahead, opportunities in connection with present National Defense needs and opportunities in the reconstruction period to follow. It has been pointed out that our profession is young. It is, but it is vigorous. During its short life span, it has picked up momentum in a geometric ratio. This assures that when tried by the challenging conditions to come, the profession of Engineering will not be found wanting in its contributions to the public welfare.

Respectfully submitted
Virgil M. Palmer
President

1942—No Meeting

President's Report—1943
C. C. Knipmeyer

This annual meeting of our National Council is unusual. The war has made it so. All good citizens are conscious of extra responsibilities in the war efforts which they face. This is particularly true of engineers who recognize that this is an engineers' war. The best equipment in the air, on the sea and on the land battlefield is almost sure to win. The planning and design of this equipment, the factory layout, the creation of machinery for production and the production of the equipment in adequate amounts are all the responsibilities of the engineer. This work of the engineer, while of transcendent importance, is not spectacular to the public eye, but he knows it is his to do through ceaseless effort. He must do his job.

So it is that the engineer delegates to this meeting could not have justified their coming except through seriousness of purpose to make our deliberations worthwhile. It would seem that not even our dinner meeting tonight should depart too far from a serious tone or fail to include some thoughtful deliberations on matters that are of vital interest to the public welfare insofar as our particular influences in engineering registration problems may be effective.

We could with pardonable enthusiasm detail the accomplishments of engineers as blessings to mankind in fields of health, safety, comforts, economics and in social as well as industrial development. We could proudly proclaim about our achievements in the war effort and about our recent creations and developments assuring a prosperous post-war period. We could point out the steady improvements in engineering education and in standards of engineers professionally and socially. We here tonight in particular could speak of the ever-increasing acceptance of engineering registration in the interests of public health and welfare with the incidental but inevitable benefit to engineers themselves. All these would be pleasant topics for discussion but less profitable than to frankly view and discuss some of our weaknesses with the hope that we make ourselves even more able to render essential service as good citizens with our special qualifications and training. Of course, we are not perfect individually or collectively. No one knows better than the engineer that improvements in machines or men can best be accomplished by study of faults rather than by extolling virtues.

Engineering registration has been showing a rapid growth in recent years. All but two states now have registration laws, and these two states are expected to come into the fold soon. More than 72,000 engineers are already registered. We are naturally gratified over this, but we are shortsighted indeed if we fail to understand the opposition that has been encountered and if we fail to follow through with proper and complete administration of the law to its highest possible effectiveness.

Some of the opposition is based on selfishness or other unworthy motivation and can be ignored. But where opposition is sincere it deserves patient and open-minded consideration. Perhaps we need not worry about those large employers of engineers who, with selfish thoughts uppermost, fear that registration will lead to a sort of unionization in their engineer staff which will lead to wage and hour and classification demands. If, however, some high-minded engineers themselves fear such a development with a consequent lowering of professional idealism, we should give them our most earnest reassurance. We witnessed such a situation recently when one of our honored founder societies had a committee of three men from three large corporations of New York City frame a new so-called Model Law which would exempt all but a very few engineers from registration requirements. This proposed new Model Law was skillfully publicized and its general acceptance would have made registration utterly ineffectual. It carried much evidence of being an insidious attack on registration, yet some of its few supporters had sincere grievances against the administration of our law. Some felt that certain state registration boards were using their power to exclude or discourage eminently well-qualified engineers of other states from practicing in their state. In their eyes this was enough not only to discredit the boards, but even to destroy all faith in registration.

With this case and similar cases to ponder should we Board members not critically examine ourselves? Should we not constantly keep in the front of our minds that, for us as professional men, the highest ideals of service should come before local interests, pet opinions, narrow prejudices and selfish thinking? Should we not realize that our acts and our attitudes as members of registration boards can have especially great influence for good or ill on the standards of engineering, on relations

between engineers and the public, and on the morale of the engineers in our respective states and of the whole nation as well? It is our legal right to examine other engineers but let us not forget that it is their moral right to examine us. And examine us they do. It is to be expected that here and there we find some of them deficient in character, but what a tragedy if they discover deficiencies in us. Generally we are politically appointed. That sort of appointment often carries unfavorable implications which may militate against us. Our own reaction to this should be only an extra watchfulness over ourselves to see that we are all the more fair and efficient.

We really need not fear that, in our deliberations together at these annual meetings, we will make serious mistakes in handling our routine problems, or even the new and larger questions which we must answer together. Our perspective, when we are together, is encouraged to be broad and clear and our spirit of cooperation is generally excellent. The danger is that when we get home we may become narrowed and provincial to the extent of losing the broader vision of national interests. Then we may lack full consciousness of the need of national unity and national cooperation. Together we realize that our state registration laws should be identical and their administration uniformly carried out. But at home we may find some local conditions that might encourage independence and arbitrariness of action which would be prejudicial to vital nation-wide progress in professional welfare. Then the oft-expressed axiom, that no part is greater than the whole, is overlooked and there is disunity where unity is so very essential. A truly cooperative spirit never denies the privilege of independent thinking nor free expression of that independent thinking in our deliberations together. Indeed such expression should always be welcome, for that is a most democratic procedure and holds a real hope of constructive betterment. But independent action spells disunity and damage to the cause which brings us together on these occasions. A high school class motto of 43 years ago, beneficently recurring often to mind throughout the years since, comes here again: "Let us then be what we are and speak what we think but in all things keep ourselves loyal to truth and to the sacred professions of friendship."

Are we big enough in character and broad enough of vision to see our larger responsibilities? As examiners we see our technical problems and responsibilities and we are determined to handle them well. But in the broader view our responsibilities go deeper and farther than that. They involve human elements and the spirit in our professional group. If a Board member does not strive in every way possible to awaken professional pride, professional spirit, and professional loyalty in the engineers of his state, he is neglecting these higher duties. Enforcing the law is one thing, but instilling pride in, and devotion to, the law is quite another thing. The one deals with men as machines, the other deals with human hearts and character. The one is cold, the other is warm. The one stifles spirit, the other awakens it to finer things.

It has often been said that engineers lack professional consciousness; that, although inwardly realizing their services to mankind, they keep themselves in the background; that they shy from public contacts. To whatever extent this is true, it is because they are individualistic and they are individualistic because natural leaders among them do not lead. No doubt many Board members are not natural leaders, but as Board members we have definite responsibilities in the encouragement of professional spirit. Society is willing to accept professional engineers at their full value to it, but it cannot be expected to do so unless and until educated to such recognition by a group spirit within the body of professional engineers themselves. In some other professions this group spirit has had remarkable growth and in consequence has gained special public recognition and esteem. Engineering Registration Board members cannot escape responsibility of effort to encourage this spirit.

Thinking along these lines is not narrow and selfish, for it should be clear that successful efforts to enhance professional pride, and thereby gain public esteem, is sure to spur our great body of engineers to higher standards and finer and greater service to society. The public clearly recognizes some professions as professions, but to many persons engineering is still a trade. It is not too much to say that engineers themselves think so, when they fear that registration might lead to the development of trade unionism within our ranks. The fearfully tremendous fact is that without the uplifting influence of professional registration and a continued educational campaign for it, unionism will do its worst in the ranks of the younger engineers.

Many young engineers have already joined unions and many more will do so unless we show an active interest in them and point the way to higher aspirations and nobler concepts. Here again it is to be said that we fail not in our technical problems but we do fail in our human problems. Our thorough preparation in the sciences and our study of nature's problems has trained us to reason and analyze skillfully, honestly and accurately and we are very human, but we neglect or fail to solve some of the human problems that are ours.

The founder societies, while properly specializing in technical advancement, occasionally make some attempts to stir their special groups into professional consciousness, group pride, and group loyalty. These efforts suffer particularly through lack of a common ground on which to weld the various groups together. There is a common ground for achieving unity and that lies in registration. Here all engineers can meet in the common purpose of raising technical and ethical standards, of advancing professional consciousness and pride, of forming a closely knit cooperative group and of earning and winning a high place in public esteem. A common ground is vitally necessary and that ground is registration.

Engineers, solidly united in each state about the central core of registration, will achieve the highest standards of public service, of technical ability and of ethical conduct. They will develop a group strength and a public support that will win the respect of public administrative and political groups. They will gain a voice in public works planning. They will be invited to apply their engineering training to economic and social problems. With these developments their self-confidence will rise to proper levels and their desire to render still higher public service will become more and more assertive. Far too long have engineers concentrated on technical problems to the exclusion of vital human problems. A poet said, "The proper study of mankind is man." No educated group has neglected this proper study to such a degree as have the engineers. Society generally, as well as engineers, has suffered from this neglect.

All this is a passing phase. The passing will be hastened by the war. Those who believed that progress in engineering art and knowledge had reached its zenith are learning little by little of the astonishing evolvements of applied science, which of course is engineering, stimulated by war necessities. Only the war's end will bring to public view the new miracles of science already functioning, but held in war secrecy. When this world conflict is concluded, the peace time applications of these developments in science will overwhelm the public beyond capacity to adapt and assimilate. A new era in engineering progress will then begin. Then, more than at any time in the past, must engineers have a deep, forceful, and active human understanding. They must be able to coordinate engineering in its narrower sense with economics and with social conditions. Their field of action must extend far beyond the purely technological. They must weigh each new technological development in the light of its impact upon both industry and society. They must educate the public to a realization that they are trained in skillful and honest analysis through lifelong respectful

association with the inexorable laws of science and that, that training in skillful and honest analysis, eminently qualifies them to deal with coordinated economic and social problems. The public will quickly accept them when their capabilities in these fields are recognized. Engineers can do the purely engineering jobs. That fact is universally recognized. But the new post-war era requires of engineers the extra understanding of human reactions and behavior. Some years ago it was frequently urged that engineering science take a five years vacation to allow a smooth social assimilation of its developments. This carried a suggestion or a confession that engineers could not properly coordinate their creations with social reactions. When engineers acquire that extra knowledge of human engineering, then they will have reached their peak efficiency in service to mankind.

President's Report—1944
Carl L. Svensen

As the National Council approaches a quarter century of existence it would seem appropriate to think of the future. We know the past, we are in the present, and the future lies ahead. It has been said that "Everything that looks to the future elevates human nature." Certainly the world experiences in war point to the need of elevating human nature and of looking to the future. People, organizations, and the governments of the world, are all looking to the future with both hope and not a little fear based upon the experiences of the past. In all of this the engineer is an important element. He has a responsibility which he must face. Much of the future is in his hands—yes—and under the direction of his brain. The engineer of the future is destined to play a larger and more important part in the elevation of human nature and so in the progress of the world to peace and security.

What, then, are the functions of the National Council in the future? What is its relation to the registered professional engineers of the future? And, a pertinent question we believe, is that of the relation of the registered professional engineers to the National Council. We are going to pose many more questions but we will not attempt to answer them. The future holds the answers. We can properly give thought to them. Some of the things we say have been said before but that is true of most things that can be said.

An organization which has functioned for almost twenty-five years can reasonably be considered permanent and must have served a useful purpose to have attained the membership of all the State Boards. Such growth is truly an evidence of life. The National Council of State Boards of Engineering Examiners was a necessary outgrowth of the passage of registration laws. It is a creation of the State Boards and will function with efficiency and with value to them, according to their own work and according to the effort and cooperation which they give to it. The purposes of the Council are the purposes of the Member Boards. In the future the problems of mutual concern can be expected to increase in number and importance. To meet this necessity for cooperation and service, a future National Council prepared to give immediate and adequate attention to the needs of the Boards and the exchange of information would appear to offer possibilities of vital importance. Will such a National Council of the future operate with a full-time staff at headquarters?

Is it an indication of interest and of the value of the National Council that we have the largest representation of Member Boards this year? In 1943 thirty-three Member Boards were represented by 63 delegates. In 1944 we have at this meeting 37 Member Boards represented by 71 delegates. Is appreciation of the value of the National Council increasing? Is there need for greater service?

What about the opportunity for regional consideration of problems? What about provision for zone meetings in between the annual meetings of the Council? The Boards in a given zone have many

problems in common. Zone meetings would also provide for consideration of all matters of registration and their presentation at the annual meetings. Would zone meetings provide for a greater, more active and more valuable participation of all Member Boards? I leave the $64 question with you.

What about the future finances of the National Council? Here again the answer is somewhere in the future. We have not yet found "the way to adequate finances" but we can continue to seek "a way" until it is possible to achieve legislative changes to permit Member Boards to provide the necessary financial support and until a knowledge of the needs of the Council and familiarity with the services of the Council become understood by the societies and individuals which compose or represent the profession of engineering. As the purpose and policy of the National Council becomes better known, it appears that support will come in the future. Sincere efforts were made in the past year to secure funds for the National Council. A letter was sent to a number of registered engineers inviting them to become Subscribing Members. Eleven national engineering societies were informed of the needs of the Council and two of them became contributors to the finances, the American Institute of Electrical Engineers and the Institute of Ceramic Engineers. Other societies which gave financial support include the American Society of Civil Engineers, the American Society of Mechanical Engineers, the National Society of Professional Engineers, the Connecticut Society of Professional Engineers, and the New York State Society of Professional Engineers. All of the national engineering societies seem to agree that the activities of the National Council are necessary and valuable. Can we expect their financial support?

What about the future of "The Registration Bulletin?" The publication of the Bulletin rates as a valuable and forward looking step. It serves a most useful purpose for the members of the National Council and interest extends beyond the National Council. Its value as a means of conveying information on engineering registration has become established. As to the future we might ask some questions and let you supply the answers. Who is concerned with engineering registration? State Boards of Engineering Examiners? Engineering Educators? Engineering Students? Engineering Graduates? Engineers in Training? Members of the national engineering societies? Registered Professional Engineers? Those who use the services of professional engineers? And others?

Beyond this we might ask why not make the future Registration Bulletin a "Journal of Engineering Registration?" Why not include advertisements to pay the expense of publication and to contribute to the finances of the Council? Why not build up a subscription list? There are about 75,000 registered engineers, there are the engineering educators, and there are the many others concerned with engineering registration. Isn't engineering registration of sufficient importance for a monthly journal? The problems of the future are many so why not provide a means for the dissemination of information on engineering registration?

Will there be a publication committee to carry on "The Registration Bulletin" or The Journal of Engineering Registration? What of the future? If 5,000, or 10,000 or 20,000 members of an engineering society can publish a national journal, can 75,000 registered engineers furnish a basis for a "Journal of Engineering Registration?"

What are some of the future relationships of the National Council? Secretary Seabury of the American Society of Civil Engineers has been quoted from an address to our National Council to the effect that: "You, gentlemen, control the future of the profession. I urge that you hold in mind that broader objective: the difference between dexterity and professionalism. Today you are deciding who are to be the engineers of tomorrow." This of course represents one phase of professional engineering of the future. Other phases are concerned with engineering education which involves

the relation of the Council to the engineering colleges and in particular to the Society for the Promotion of Engineering Education. That society may well cooperate in the education of engineering students in the history of the registration movement, the meaning of professionalism, and the requirements for registration. The S.P.E.E. is giving increased attention to the cultural and professional aspects of engineering education and has taken notice of the engineering registration laws. With registration necessary for admission to the engineering profession in all but two states, a proper understanding of the common ideals and purposes which concern engineering education, engineering registration and the engineering profession, is an objective for the immediate future. Each one of these groups needs to know and to understand the other. They need to realize that together they form a unity.

Still another phase is the National Society of Professional Engineers composed wholly of registered engineers (but entirely independent of the Registration Boards). This group is concerned with the professional aspects of engineering, and their function appears to be that of correlation and cooperation in engineering education, in engineering registration, in ethical standards, in enforcement of registration laws, and in maintaining the professional status of engineers and engineering. It appears to be an inclusive society of an auxiliary character as it brings all branches of engineering together for the mutual good of professional engineering as a unity, such a unity as the doctors have in the American Medical Association and the lawyers in the American Bar Association. Will there be engineering unity in the future? The National Society of Professional Engineers has asked for and been granted a joint committee with our National Council to seek ways of cooperation and aid. Will this bring about a better understanding of the problems of engineering registration which confront the Member Boards of our Council as they relate to the administration of the registration laws?

Is it desirable to have a similar joint committee with the Society for the Promotion of Engineering Education to bring about a mutual understanding of the problems of engineering education and of engineering registration as they relate to each other?

It is true that the Engineers' Council for Professional Development is comprised of representatives of the elements of engineering education, engineering registration and engineering practice, but it has its truly great and valuable work to perform. It cannot be partial to or specialize in the fields of any of its constituent members. It serves a most useful purpose to each of them. And in the phase of professional development the publication of Dr. Wickenden's "The Second Mile" is truly a milestone which should be read by every one of the 75,000 registered professional engineers as well as by every engineering student and by every engineering teacher.

Another phase is the accrediting of engineering courses by the Engineers' Council for Professional Development which forms the basis for the acceptance of engineering education "satisfactory to the Board." The E.C.P.D. is therefore a most useful agency to both the engineering schools and to the Boards.

Another phase includes the founder societies covering the practice of the profession in its various branches and the development and dissemination of technical knowledge. It is logical to expect that the members of these societies in the future will all be registered professional engineers or engineers in training. Such a future condition will naturally bring about a closer relationship between these societies and the National Council as the engineering qualifications become a matter of close correlation.

Is it desirable to have joint committees with the founder societies to bring about a mutual understanding and agreement on the engineering qualifications, the practice of professional engineering, and other related matters?

Again there comes the question of the desirability of joint committees to better serve the objectives and purposes of our National Council—to provide the services which will lead to a better and more uniform administration of engineering registration in the future, and to bring together the collective wisdom of engineering education, engineering registration, and engineering practice, all to the end that the society may be better served, protected, and yes, elevated by the profession of engineering.

What are some of the future problems and questions for the National Council to consider? The problems of the past are still problems of the future. The problem of uniformity of registration laws is one for the future and when solved it will solve many of the other problems which are involved in engineering registration. Should this matter of uniformity of laws receive more attention by the National Council to seek attainment in the near future rather than the far future? Should there be provision for the retention of the best legal talent for advice and counsel in connection with changes and amendments to registration laws? Would this hasten the day of uniformity?

What about facilities for furnishing information to Member Boards on all matters related to or affecting engineering registration anywhere in the country?

Other problems have to do with the evaluation of wartime engineering education and wartime engineering experience. There is the matter of the "Engineer-in-Training" which needs consideration. Other matters for the future might include provision for maintaining a complete file of all rosters, forms, instructions, etc., of all State Boards; provision for a library or file of books, articles, and publications which have to do with engineering registration; provision for a file of material on examinations to be worked up in cooperation with the Committee on Examinations; provision for an adequate and trained staff at headquarters to work with the various committees to insure continuity of studies and research.

There are other problems of the future which are continuing problems from the past and are represented by the Council's committees, and there will be new problems of vital importance in the post-wartime of the future.

What about the future of reciprocal registration? The question is becoming increasingly important and many of the difficulties which appear to exist have been collected by our Committee on Reciprocal Registration. Some of the difficulties reported come from lack of understanding on the part of registered engineers. Other difficulties are real. Many of them come about from differences in registration laws and cannot be changed without legislative action. Boards must base their actions on the law as it exists in their own state. It would appear that we must wait until the future brings about uniformity in the requirements for registration before we can expect an approach to uniform reciprocal procedure. In the meantime we might ask: Would it be desirable to prepare a simple, clearly stated list of the reciprocal requirements of each state in a form that would tell the applicant what he wants to know? Would such a list, verified by each Board, serve as a means to bring desirable changes to the attention of the Boards and shorten the time to future uniformity? Reciprocal registration looms as a post-war problem. As engineers in the armed services and on war projects return to peace time work, many of them will participate in engineering developments over the country in other than the states of original registration.

What can the future learn from the past? Where has the National Council been weak and where has it been strong? In this, the report of the Committee on the Effects of Registration deserves thoughtful attention. After all registration is still on trial even though we are encouraged and pleased with the progress which has been made and the growing recognition of the value of engineering

registration to the public in safeguarding life, health and property. A strong public sentiment favorable to professional engineering as represented by the registration laws is a necessary prelude to the effective operation of the laws. This will come when the value of the protection which is afforded becomes known.

We might think of the differences in registration laws as a weakness and of the recognition of this weakness as a strong reason for a strong National Council in the future. The strength or weakness of the future will be influenced by the degree of cooperation attainable and the unity which can be attained by Membership in the National Council. This membership is comprised of the Member Boards.

It is true that the primary responsibility of Board members in the future, as it has been in the past, will be the administration of the law as it is written in the statutes of their own state. Integral with this there are other responsibilities which cannot be separated. Professional Engineers and the public alike see professional engineering in the Members of the State Board. It is from the Board and through the registered engineers that the public of the future will learn the full meaning of engineering as a profession. The mere passing of a law is no guarantee that it will be respected and enforced. The success of any law depends upon need for the provisions of the law and knowledge of the provisions of the law. Familiarity with these factors must pass from the Board to the registered engineers and from them to the public. All of this takes time. The attitude of the Board toward the many factors which must be present if engineering is to be accepted as a profession will be reflected by the registered engineers. The care and fairness exercised by the Board in the consideration of applicants from their own or other states have much to do with the respect accorded to the law and to the value attached to the certificate of registration. From this there will come in the future—an engineering consciousness. The spirit of a profession will come and with it a sense of the ethical obligations which are the responsibility of a legalized profession.

The value of engineering to mankind seems to be realized but confusion still reigns in the public mind as to the functions of the professional engineer. This is true not alone in the minds of the public at large, but also in the minds of many technically trained men and engineering workers. It is difficult to separate the materials, machines, apparatus, and physical structures from the "powers of the mind" of the professional engineer, who conceives the entire project—The mind which applies the materials and forces of nature to the use and convenience of mankind.

The future would seem to call for the engineering education of the public as well as for the future engineer. The engineering education of the public will differ because it is for a different purpose.

We can review the shortcomings of the past and from them learn for the future. We can be justly proud of the achievements and the progress which have been made, and of the value of engineering registration to society. But all of this is in the past. Today looks to the future and to the ways and means of providing for the proper functioning of a National Council in keeping with its importance in the services which it can render to the Member Boards, and through them to professional engineering and to the public.

Recognition of the profession of engineering will be what it is made by the examples of individual practice, dissemination of knowledge of the Act to the public, and the respect which is brought about by the strength and representative character of the profession as members of society at large.

What then is the place of the National Council of the future? Will it be a clearing house of information and a unifying service to bring about a complete understanding of the common problems of all the Member Boards? Will it assist in the correlation of the many elements of

professional engineering—the elements of education, experience, ethics, and human relations? Will it exert an influence that will bring closer that future time when the professional status of engineering will be on par with the legal and medical professions?

What will be the value of the National Council to professional engineering of the future? Will it be representative of the Member Boards and through them unite the seventy-five thousand registered engineers into a forward looking, standard raising, professionally minded body, each part contributing to the advancement of the whole?

With humble pride in the National Council of the past we look with hope and confidence to a greater National Council in the future which will aid the engineers of our country to attain that unity of effort, that common understanding, that responsibility to society, and that public recognition, which taken together will make engineering a real and truly great profession.

No Meeting—1945

President's Report—1946
H. T. Person

Just a few words about the history of the National Council of State Boards of Engineering Examiners might not be out of order at this 25th Annual Meeting. The National Council was founded in November 1920. It has been functioning as an organization for 26 years. There are a number of delegates here today who have attended most of the 25 annual meetings. That a goodly number of Board Members have and do attend the annual meetings of the National Council year after year, I believe, is the best testimony as to the effectiveness of the program and work of the National Council.

The National Council was established by a small group of States having Engineering Registration Laws. This group felt there was a need for uniformity in the procedures of examining and in the methods of evaluating the professional experience of candidates for registration. It was felt that uniformity in the requirements and procedures for registration was essential to the establishment of reciprocal relations between the several states. The early committee activities of the National Council were based upon this objective.

At the time the National Council was organized, twelve states had Engineering Registration Laws. Today 47 states, Alaska, Hawaii and Puerto Rico have Registration Laws.

The National Council has assisted many states in drafting their original Engineering Registration Statute. It has helped many states in the preparation of revisions of and amendments to their registration laws.

The National Council in 1929 proposed the drafting of the Model Law, which has been developed into the present approved edition. It has always participated actively in the work of keeping the Model Law revised and up to date.

The National Council started the program for the accrediting of Engineering Schools. It published the first list of accredited engineering curricula.

The National Council assisted in the formation of the Engineers' Council for Professional Development. It has been an active participant in the work of this group since its organization.

I wish I had time to review further the history of the accomplishments of the National Council, but this would mean reviewing the many reports of the committees of the Council and I am sure that if you are interested in any report from me, it is a report on the activities of the last two years.

First, I would like to say a little about the 1945 and the 1946 budgets. Those of you who were at the 1944 meeting in Lexington will recall, that after much discussion, a budget of $10,000.00 was approved for 1945. The preparation of the itemized budget was left to the discretion of the Board of Directors. At that time you may recall there was some fear that the approved $10,000.00 budget might exceed the 1945 revenues. We are pleased to report that the income for the year 1945 was $10,237.00. Expenditures for the same period were $9,041.18 or almost one thousand dollars less than the approved budget.

Since no meeting was held during 1945, the Board of Directors was responsible for establishing the 1946 budget. The Board of Directors approved the same budget for 1946 ($10,000.00) as the Council had approved for 1945. I note from the report of the Public Accountants who audit the accounts of the National Council, that the income for the period Jan. 1 to Sept. 30, 1946 is $9,742.75 and that the expenditures for the same period are $7,467.24.

Detailed reports on the income and expenditures for both 1945 and 1946 will be made by the Executive Secretary.

At the 1944 meeting in Lexington, the Board of Directors was directed by a resolution to study means of improving the program and activities of the National Council. The same resolution included a directive to the Board of Directors to make such recommendations for constitutional changes as were necessary to attain this objective.

In connection with this resolution, it might be well to review briefly the purpose and objectives of the National Council. At the time of its organization and still today, the primary purpose of the National Council is to assist State Boards in a cooperative effort to obtain more efficient and uniform administration of State Registration Statutes. Its activities include the certification of registered engineers for registration by endorsement—service to Member Boards in connection with the administration of Engineering Registration Laws—service to national and state engineering organizations interested in the licensing of engineers—and service to individuals interested in Engineering Registration. It serves as a national clearing house and information bureau in all matters pertaining to the legal registration of engineers. The committee activities of the National Council are primarily directed to attain these objectives. These general objectives and the committee activities as defined and assigned in the Constitution are the program of the National Council.

In line with the directive from the delegates and Member Boards at the Annual Meeting in Lexington, the Officers and Directors have studied the Constitution and By-Laws of the National Council. In an attempt to state more clearly the objectives and to outline more clearly the activities of the various Committees, amendments to the Constitution and By-Laws have been prepared. These amendments have been sent to every member of committee for review and suggestions. They have been reviewed and unanimously approved by the Board of Directors. They have been reviewed and approved by the Committee on Constitution.

We believe that the Constitution and By-Laws with the proposed amendments make a clear and concise outline of the program of the National Council. We believe that this is the program that the National Council should undertake. We believe that it is a program that the National Council can adequately finance.

In connection with the program of the National Council, I want to touch briefly upon some of the committee activities. The actual work of these committees for the last two years will be reported today and tomorrow by the Committee Chairmen.

Let's look for a moment at the work of the National Bureau of Engineering Registration. The applications for Certificates of Qualification and the cash receipts for the last twelve months have

trebled over what they were in the same twelve month period ending two years ago. The National Bureau's work will undoubtedly increase even still more. This is an essential service to engineers and to Registration Boards. It is a job that can't be done properly with a part-time national headquarters.

The work of the Committee on Uniform Laws and Procedures isn't completed. Many of the State Registration Statutes need revision and strengthening. Collecting data on court decisions and legal opinions affecting the administration and enforcement of registration laws isn't a static thing. Today there is a lot of work to be done just to bring this job up to date.

The continuing work of the Committee on Qualifications for Registration is as significant today as it was ten or fifteen years ago. Procedures of examining candidates and standards for the evaluation of qualifying experience need continual study and revision.

The program and work of the Committee on Engineer-in-Training is just getting started. This program is one of the most important and significant that has ever been undertaken by the National Council.

I could go on and review the work and programs of the other Committees. You know them and their importance better than I do. But I do want to emphasize again that the program as outlined by the Constitution and By-Laws is not a part-time program, that can be carried on effectively with a part-time headquarters—and a part-time budget—and a part-time Secretary. Either the budget has to be increased or the program will have to be reduced.

In this connection, you will recall, that at the 1944 Annual Meeting the Board of Directors and the Finance Committee were directed to study and take steps to secure adequate finances for the National Council. The same motion included a directive to the Board of Directors to prepare, if necessary, a constitutional amendment to attain this objective.

I believe that there are a goodly number here who agree that the program of the National Council should be largely financed by the Member Boards. In fact, this is the only sound way to finance the program of the Council.

In view of your directive at the 1944 Annual Meeting, and to get the matter of finances out of the realm of jawing and talking and into the realm of reality, the Board of Directors has recommended a constitutional amendment increasing the membership fees paid by the Member Boards. The proposed schedule of fees would, if all Member Boards paid, provide an annual income of about $10,000.00. Whether we adopt the proposed schedule of fees or some other schedule is not important. The important thing is that we do adopt a schedule which will provide an annual income of about $10,000.00, with all Member Boards paying. The income from Member Boards with such a schedule of fees, together with that from the National Registration Bureau and from national and state engineering organizations, would take care of the 1947 budget proposed by the Board of Directors.

In October 1945, Secretary Legaré completed his assignment with the War Production Board. At that time he had to make the decision as to whether or not he would continue as Executive Secretary of the National Council. Fortunately for the National Council, Keith decided to continue his work with the National Council, although it meant a substantial sacrifice in salary compared to what he may have made in a number of other jobs. Since January 1946, he has devoted full time at a part-time salary, to the duties of Executive Secretary of the National Council. Frankly, I am wondering how we would have kept the National Council going without his full time services.

In concluding: In behalf of the Officers, Directors and Member Boards of the National Council, we express sincere appreciation to the following national and state engineering

organizations for their financial support and interest in the program of the National Council during the years 1945 and 1946.

American Society of Civil Engineers.
American Society of Mechanical Engineers.
American Institute of Electrical Engineers.
National Society of Professional Engineers.
Institute of Ceramic Engineers.
New York State Society of Professional Engineers.
New Jersey Society of Professional Engineers.
Texas Society of Professional Engineers.

Also, in behalf of the National Council, we express appreciation to the national organizations that have official representatives at this 25th Annual Meeting of the Council. Also, we express appreciation to each member of every committee for their work during the past two years.

Finally, I wish to express my own personal appreciation and thanks to each member of the Board of Directors for their splendid spirit of cooperation during my term as President. Also, I express my deep gratitude to Secretary Keith for his advice, patience and continued assistance during my term as President.

President's Report—1947
John Remington

The functions of this National Council and of its Member Boards concern not only the general public but also every professional engineer, therefore, it is of prime importance that we have the cooperation of all organizations of engineers. This objective has been accomplished to a large extent at this meeting by the attendance as honor guests at our Banquet the official representatives of all the principal national engineering societies. Secretary Legaré, with my approval, invited the executive officers of twenty-five engineering organizations, including two in Canada and the National Council of Architectural Registration Boards, and he promptly received one hundred percent acceptance from these officials. This seems to me to be an outstanding demonstration of the solidarity of the engineering profession and of the general approval and support of the activities of the National Council.

The finances of the National Council have been discussed at length at Annual Meetings and it is certainly gratifying that we can report this year that this problem seems to be in line for a satisfactory solution in the near future. Two-thirds of the Member Boards have paid their 1947 membership fee in accordance with the new schedule of fees adopted last year, and only eight Member Boards did not increase their membership fee this year. Several national and state engineering societies are contributing to the financial support of the National Council and in my opinion such support is mutually beneficial. As I mentioned before it is important that we have the interest of the engineering societies and the fact that some of them include a sum for the National Council in their annual appropriations is concrete evidence of their interest.

The budget presented by the Board of Directors for the year 1948 is the same as tentatively agreed upon by the Board two years ago and it is a well-known fact that the cost of operation of all organizations has greatly increased. We think our Executive Secretary is to be commended if he can keep the expenses of the National Council within the modest budget that is proposed.

The membership of the National Council now includes all of the states and possessions of our country and we are, therefore, now in a better position to coordinate the work of the Registration Boards and to recommend uniform requirements, examinations and procedures. The number of registered engineers has greatly increased and with this increase, the opportunities and responsibilities of the National Council have also steadily developed. I, therefore, sincerely urge your wholehearted support of the officers of NCSBEE during the coming year in their efforts to carry on this important program.

President's Report—1948
G. M. Shepard

One of the requirements in our Constitution is that the President at the Annual Meeting present to the Council a report of the activities during his term of office.

At the New York meeting of the Board of Directors the various committees were appointed. In a short article in the *Bulletin* for March 1948, I called attention to the extremely important part committee activities have in the work of the National Council of State Boards of Engineering Examiners. The reports of these committees will be given in the forthcoming sessions. We are, indeed, grateful to the chairmen and members who in many cases at personal sacrifice, both as to time and energy, have continued to serve.

Our Executive Secretary, Keith Legaré, as you know, between the Annual Meetings keeps the Boards advised of all matters requiring action by the Board. I am taking this occasion to advise my successor to acquire an additional filing cabinet. Along with his facility of keeping carbon copies in the mail, Keith does an excellent job in editing *The Registration Bulletin* which I understand now has a circulation of over a thousand. And by the way, Keith is completing his 25th year as Executive Secretary of the National Council.

Necessarily all interim action by the Board must be done by correspondence. One committee meeting was held, that of the Committee on National Bureau of Engineering Registration, on Jan. 21, 1948. The adoption of the amendment to the By-Laws at the New York meeting substantially raised the standard of qualifications for issuance of the National Bureau Certificate of Qualification. In view of these higher standards many Boards have felt that the grading system in effect for the past two years might be dispensed with. This being a matter for administrative action by the Committee of National Bureau of Engineering Registration, I referred the matter to this committee shortly after taking office in October. The committee at its New York meeting decided to discontinue the grading system. Dean Dougherty outlined the Registration Bureau changes in the March *Bulletin*.

Further action of this particular committee was taken in revising the wording of the endorsement by State Boards on Certificate of Qualification. The action taken will, it is hoped, facilitate the issuance of Certificates of Qualification involving registrants in states which have taken exception to the old endorsement features. The increased use by practicing engineers of the facility afforded by the Certificate of Qualification is in itself an indication of the value and widespread approval by the engineering profession of the Certificate of Qualification as issued by the National Bureau. As you will hear in the committee's report, the Bureau is endeavoring to raise the standard for the Certificate of Qualification so that it will be accepted by all states.

Following considerable discussion at the New York meeting a motion was adopted instructing the Executive Secretary to send out a questionnaire to the various boards for the purpose of securing information as to policy of registration by endorsement for so-called "grandfather" registrants. The

questions and replies appear under the head of "Survey of State Board Procedure" of the published reports. This is quite an excellent report and the returns were received from a great many of the states. You will find it interesting reading if you are concerned with this particular problem.

The matter of finances is of course a perennial subject. Our finances have improved to the extent that more states are paying the full fee and certain states having larger fees have found ways and means of paying such fees. It seems to be the consensus of opinion of our members that although we should strive to become independent of the contributions from engineering societies, that the time has not yet arrived for this to be possible. On the other hand, there is much to be said for the view that a contribution increases the interest on the part of the organization making such contribution. The engineering society that contributes $100.00 or $500.00 to the work of the Council will undoubtedly show more interest in its activities than if no contribution were made. Active interest by engineering societies in the work of the Council is, in my opinion, extremely desirable.

There has been during the past year, as always, correspondence as to why certain membership fees cannot be paid in full, or perhaps at all. Undoubtedly there are some cases, and I believe relatively few, where the difficulties to payment are insurmountable. Many of us feel that a registration board is more or less of an autonomous body with full authority to accomplish the purposes set forth in its law. The authority of the Board includes in most cases the right to expend the funds entrusted to it. Engineers do not shrink when it comes to spending money on the various engineering projects which we design and construct. In my opinion we should give the National Council the financial support it requires. If your law really doesn't permit it, your engineers undoubtedly have sufficient prestige to affect a change. I wish to place before you the necessity of supporting my successor in the matter of membership fees to an even greater extent than has been the case in my own administration.

Of particular interest in engineering circles of the states is the Engineer-in-Training program. At our last meeting seventeen states had such a program. At the present time this has been expanded to approximately half of the states. Interest in other states is increasing. In New York State a total of 1,208 candidates took the written professional engineer examinations in July. The New York State Board announced that 658 candidates took the preliminary examinations to qualify as Engineer-in-Training; thus for the first time there the number of candidates for Engineer-in-Training exceeded the number of professional engineer candidates. The point brought out by the New York State Board was that a very desirable pattern has been established whereby future professional engineer candidates will voluntarily have obtained their preliminary qualification as Engineer-in-Training soon after graduation. In my own state during the current year of 1948 we will have given Engineer-in-Training examinations to approximately 550 candidates, or more than twice as many as will have applied for final professional registration. The same can be said for other states. It is evident that the young engineer to be is becoming registration conscious. Let us encourage this spirit and facilitate the exchange of Engineer-in-Training credits between states.

I think that you will agree with me that each Annual Meeting gives evidence of progress in the mutual understanding of the particular problems with which individual boards are confronted. We may not always agree as to the solution, but I am sure that no one, on this account, would forego the opportunity and privilege of meeting together at one of these conventions and exchanging ideas.

It has been a pleasure to serve as President of this Council for the past year. I wish to express my thanks to the members of the Board for their assistance, and to the chairmen and members of the various committees, and to the Executive Secretary and his office staff for their untiring efforts.

President's Report—1949
Alexander Blair

In the past Council year it has been gratifying to observe that two Zone meetings were held—one of the Northeastern Zone in January at New York, attended by your president; the other, of the Central Zone in May, at Columbus, Ohio. I believe these Zone conferences serve a valuable purpose, when attended by so many of their member boards, as these were.

Between Annual Meetings *The Registration Bulletin*, edited by the Executive Secretary, has been an informative medium between the officers of the Council and the Committees, on the one hand and the member boards on the other.

The work done by the various committees in the past year has resulted in most interesting reports of a very high standard which deserve the gratitude of the Council, for, oftentimes, they reflect considerable self-sacrifice on the part of committee members and especially of chairmen.

Some of these reports comprehend questionnaires reflecting the replies of all member boards, whose response has been so complete as to make the reports even more valuable. These deal with matters of ever-increasing importance—uniformity of laws and law enforcement, effects of registration, registration qualifications, registration by endorsement, certification by National Bureau, Engineer-in-Training, ECPD (with accreditation and other activities), relations with engineering organizations, and land surveying. The keeping of our constitution and by-laws alive and up-to-date instruments is also considered herein. I would like to refer to these in detail but to do so would consume valuable time. I leave you to hear them and judge of their merit.

Twice during my term of office I have visited Council headquarters in Columbia, to consult with the Executive Secretary and to observe the workings of the office. I would like to compliment the Secretary on the excellent filing system, the efficiency, the neatness, and order that was evidenced.

As indication of growth in registration I would like to draw attention to tabulation in Appendix D of the Executive Secretary's report. It shows a net gain in engineer registrants of nearly 20 percent over 1948 figures, and compared with the data of five years ago the registration has more than doubled.

The greatest part of this increase in the past year, however, is due to the enormous gain in engineering registration in California, accounting for three-quarters of our total. (It will be noted that in 1949 California has paid double the scheduled fee it paid in 1948.)

In Illinois and Ohio there is a slight loss in engineer registration as compared with last year's figures. The average increase over 1948 in engineer registration for all states, except California is about 6.3 percent which it is interesting to compare with the growth of the entire engineering profession, shown as about 4.4 percent in the report of the Bureau of Labor Statistics, U.S. Department of Labor. (This latter is based on a year's average, over the period of the past eight years.) It would appear to indicate a gain in registration.

Figures in Appendix D reflect a loss of Land Surveyor registrants, during the year, the total being roughly 4 percent below 1948. The boards chiefly accounting for this shrinkage are Illinois, Pennsylvania, Puerto Rico, Rhode Island and Texas, all recording fewer registrants than last year.

From Appendix D the Executive Secretary's report it will also be observed that 11,524 Engineers-in-Training in all have now been registered in 19 states, which shows a tremendously increased use of these examinations by the young engineers in the past year, when compared to the figures reported in 1948.

These young engineers and the role to be played by their registration, will have so important a bearing on the future of the profession, that to meet the challenge of this new development in registration calls for our whole hearted cooperation.

The report of the Public Accountants auditing the books of the Council for the period of July 1, 1948 to June 30, 1949 has been received and is now in Council files. The finances of the Council are gradually becoming established on a sounder basis and nearly 80 percent of the member boards are now contributing fully on the basis of the scale of fees adopted in 1946. It is expected that the total income for 1949 will be approximately $18,000 against which the Board of Directors budgeted $17,000 expenditures, but the actual sum disbursed will be considerably less.

Due to the sound administrative procedure on the part of the Executive Secretary and of successive boards of directors a reserve fund is slowly being built up, which together with the cash balance is estimated to reach about $13,000 by Dec. 31, 1949. (It is perhaps fitting to mention that in 1923 the cash balance was $30, and the Council owed $357 to three state boards.)

I am sure careful consideration will be given to our financial policy in the coming years so this growing surplus may be conserved for needs now unseen.

At the Central Zone meeting held in Columbus in May, the question of relinquishing outside contributions was raised; this refers to the contributions now being made by National and State engineering organizations. If such a step is to be taken it is urged that it should only be done after the Council has become self-supporting, following upon an exhaustive study of necessary expenditures and of sources of income by the Finance Committee, so that a well-defined policy can be followed.

To show something of the development of Council finances some graphs were made covering the past 25 years to enable this picture to be more readily visualized. Also, since a question has arisen concerning the dual basis of our adopted scale of fees, the graph, not heretofore published in the Year Book, is being reproduced by the Executive Secretary, showing how the scale of fees is derived, partially on a basis of service rendered uniformly to all boards alike and in part reflecting the number of registrants.

Several years ago under President Person a three-year plan was adopted which succeeded in advancing the financial status of the Council.

Perhaps if the Finance Committee were requested to make their studies of income and expenditures comprehend such questions as have been raised, a solution to this problem might be worked out to the satisfaction of a large majority of the member boards. In this way the subject would not need to come up for discussion at annual meetings, thereby ensuring time for consideration of subjects of greater importance to the registration boards in general.

Acknowledgment should be made of the continued and generous support, moral as well as financial, of a number of national and state engineering organizations.

Before relinquishing my post as President of the Council, I wish to thank the members of the Board of Directors for their unfailing and loyal support, all chairmen and members of committees for their work well done, and to express appreciation to the Executive Secretary and his assistants for their close cooperation and for the conscientious and efficient manner in which their duties have been fulfilled.

I am sure this same cooperation will be extended to my successor and I assure him of all the help I personally can give him during his term of office. (Applause.)

Registration—A Dream Come True
By D. B. Steinman, Past President
Address at Banquet, Annual Meeting, Nov. 12, 1949

In the audience before me, I see many of the pioneers and leaders in the Engineers' Registration movement. For them, for all of us, for the entire profession, Engineers' Registration is a dream come true.

Because we had the vision, because we believed, heart and soul, in Engineers' Registration, because we were convinced that this movement represented an indispensable forward step of progress for our profession, we consecrated ourselves to this cause and dedicated to it our best energies and talents. We had to overcome complacency and disparagement, prejudice and misunderstanding, vested interests and selfish obstruction, secret opposition and open antagonism. Through thirty years of heartbreaking strain, we had to fight and battle for every step of progress. We had to pour out our energies and exert our best forces of logic and persuasion to convince the profession and the public—the legislators, the public officials, and our own fellow engineers in state after state—before we could secure acceptance of the principle and the enactment of the desired legislation. And because we were willing to give to this campaign all of our strength and devotion in unsparing measure, without counting the sacrifice and the cost, our cause has won and our dream has come true.

The full story of the thirty years' battle will never be told. Future generations of engineers will not know the fight we fought for them, in order to lay the foundation for a defined, united and recognized profession. Even our own contemporaries know little of the struggles, the heartaches, the sacrifices, the battles that were the price of achievement. We, who fought the fight, carry away the scars of battle. Our sole driving force was an inner sense of conviction, a spirit of professional dedication. Through the strain and the heartache, the sole heartening feature was in the wonderful teamwork developed among brother engineers united by the same inspiration, sharing unselfishly and devotedly in sacrifice, in effort, and in zeal for a consecrated ideal. And our sole reward has been in seeing the progressive achievement of our objective to final accomplishment.

In the winning of state after state, sweeping the country from west to east and from south to north, from Wyoming in 1907 and completing the circle to Montana in 1947, it took exactly forty years to achieve success. The real battle covered the last thirty of those years. By 1919, only four states had enacted Engineers' Registration Laws. By 1921, a concentrated campaign had increased the number to twenty. Then, for a time, real progress seemed halted, with only eight more states gained during the ensuing eleven years and no further gains in sight. The forces of discouragement, disparagement and opposition had gathered strength and appeared to be successfully blocking further advance and threatening to reverse the tide. For a time, the fate of the Engineers' Registration movement seemed hanging in the balance. Then, in 1934, new forces were mobilized, national in scope, supplying the needed new impetus and the needed unity of inspiration and dedication. The deadlock was broken. The following year seven more states were won for Engineers' Registration, and in the next few years more states were speedily added to the list until the roster was complete. Temporary setbacks and threatened defeat had been turned into victory.

In 1920, when the National Council of State Boards of Engineering Examiners was founded, only twelve states had secured Engineers' Registration laws. Now, since 1947, Engineers' Registration laws are in force in all of the 48 states and in all of the territories of the United States.

In 1920 there were only a comparative handful of registered Professional Engineers. Even as late as 1928, there were only about 12,000 registered Engineers in the United States. Today we have over 150,000 registered Professional Engineers, and the number is steadily growing.

Engineers' Registration is now an established fact, and it is here to stay. The victory has been won.

As we look back upon the struggle and the strain, the personal sacrifices and consecration, we feel repaid in knowing that the battle was worthwhile. What has been achieved is of enduring value, both for the public and for the profession.

We fought for Engineers' Registration laws because we believe that the practice of Engineering is a public trust and that the work of no other profession more truly concerns the public interest and the safety of life, health and property.

We fought for Engineers' Registration laws because we believe that a profession should be empowered to disown the unfit and the unprincipled who seek to practice in its name.

We fought for Engineers' Registration laws because a profession is judged by the qualifications of all who use its name, by the failures of the incompetents and by the conduct of the unworthy, unless a clear dividing line is established in public recognition between the lawful practitioners of the profession and the illegal practitioners and impostors.

We fought for Engineers' Registration because it placed the force and sanction of the law behind the efforts and aspirations of the profession to maintain high standards of preparation, of qualification, and of ethical practice.

We fought for Engineers' Registration because we were dedicated to the advancement of our profession—the advancement of its standards in public service and the advancement of its standing in public recognition and esteem.

We fought for Engineers' Registration because no other agency could accomplish these objectives.

Without Registration laws, there is no way to stop the practice of Engineering by the non-engineer.

Without Registration laws, there is no way to stop the misappropriation and abuse of the designation "Engineer."

Without Registration laws, there is no way to oust from the profession those who prove incompetent and unworthy.

Without Registration laws, there is no way to protect the qualified engineer, in his rights of practice, against restriction, encroachment, and unqualified competition.

In different states, legislation sponsored by architects would have eliminated or subordinated the engineer in the structural field; physicians endeavored to monopolize the sanitary field; accountants sought to exclude others from the making of financial reports; legislation proposed by lawyers would have deprived engineers of the right to prepare contract documents and to engage in arbitration proceedings; and real estate brokers endeavored to monopolize the right to make appraisals. Without our registration laws on the statute books, recording the rightful scope of practice of the professional engineer, our cause would have been lost. We would have been subordinated to other professions, our established field of practice diminished, and our profession dismembered.

In our battles to preserve our established rights of practice against restriction, an easy way to surrender would have been to break up our profession into branches and specialties, with different qualifications and separate licenses for each division. But this we strenuously declined to do. Through our registration laws we have recorded the principle that engineering is *one* profession, although specialties may be many. Law and Medicine have as many specialties as Engineering, but lawyers and doctors would never consent to the legal subdivision of their professions.

We do not license the specialist; we license the Engineer. We do not place any legal limitation upon the specialty in which the Engineer may engage. As in Law and Medicine, self-limitation of field of practice has been kept a matter of professional honor, and legal limitation has been rejected.

Others may wish to emphasize the diversification of Engineering into specialties. It is for us to proclaim the fundamental unity of our profession. We have fought for this principle, and we have won the battle. Whether a man writes C.E., E.E., M.E., E.M. or Chem. E. after his name, he has fundamentally the same common basic educational training, the same governing professional qualifications, the same method of analytical approach to technical problems, the same ideal of professional practice, and the same interest in the profession's problems of public recognition, protective legislation, and relations with other professions.

Unfortunately some of the state Registration laws were initially written or administered from the viewpoint of a divided profession, with classified Registration designating limitations of qualification or practice. Through the National Council, the prevailing judgment has finally become crystallized that such classified Registration is a mistake. We do not want our profession dismembered. We do not want jurisdictional disputes within our profession. We do not want Registration based on limitation of qualifications. We do not want our profession pictured as a "heterogeneous aggregation of trades and specialties." We do not want our Registration procedure to proclaim that a professional man cannot be trusted.

Registration can and should be used to strengthen the solidarity of our profession. Registration can and should be used to tell the world that Engineering *is* a profession, that Engineering is a *learned* profession, and that Engineering is *one* profession.

Through Engineers' Registration, we have brought the legislators and the public to recognize the fact that Engineering is not an empirical calling, but a learned scientific profession—that Engineers are not technicians but professional men. We have written professional education and professional examinations into the laws, and these standards are being progressively raised.

Through the influence of Registration and to meet its needs, a program of accrediting Engineering schools and colleges has been inaugurated. This program has had a direct and prompt effect in raising the standards of engineering education—in improving curricula, quality of teaching, educational plans and equipment, and size, caliber and compensation of teaching staffs.

Before the advent of Engineers' Registration, a large proportion of engineers received their sole training through apprenticeship, in the school of experience. Engineers of the older school actually belittled the value of formal schooling. Registration has proved an effective instrumentality in changing this picture. Professional education, preceded in many cases by pre-engineering college education and followed in a rapidly increasing number of cases by graduate study and advanced degrees, has now become the rule. The gates are not yet barred to the man who has "come up the hard way" through night schools and home study, and he is given an opportunity, by taking the same written examinations as the college graduate, to show that he has equipped himself with the same professional education and knowledge. For such applicants, however, a substantially longer period of training and experience (a minimum of twelve years in some states) is required before admission to the examinations.

The older tradition, placing the emphasis on apprenticeship rather than on education, was recorded in the membership requirements of the national Engineering Societies; six years of apprenticeship constituted the qualification for admission and, if a young man invested four years to graduate from an engineering school, this professional training was credited as equivalent to only two years of field experience. This unbalanced rating actually placed a premium on avoidance of a college education. Engineers' Registration has shifted the emphasis. The premium is now placed on approved professional education, and the back-door route into the engineering profession is being progressively eliminated.

For years other agencies were talking about such objectives as professional recognition, junior guidance, protection of the professional designation, enforcement of ethical standards, and the ideal of professional unity. Now all of these objectives are being accomplished by Engineers' Registration. It has changed the picture from talk to action, from mere wishing to actual fulfillment. Engineers' Registration is making the Profession's dreams come true.

A valuable and fruitful new development recently added to Engineers' Registration procedure is the certification of Engineers-in-Training. Inaugurated in New York State in 1943, this feature has been speedily adopted in state after state. It permits the young graduate to take part of the qualifying professional examinations immediately after graduation, and upon passing these preliminary examinations he is officially certified as an Engineer-in-Training. This procedure bridges the gap of the four years between graduation and full professional licensure, and solves the problem of identifying the young engineer with the profession during this most difficult and critical period of his career. With this preliminary certification as an Engineer-in-Training, we start the young man on the road to professional qualification and recognition, and facilitate his speedier attainment of full professional status through Registration. We not only give the young engineer professional identification and consciousness, but we also supply him with professional backing and orientation, acquaint him with professional obligations and ideals, imbue him with pride in the profession, protect him from unethical influences, and facilitate relations of guidance, counsel, encouragement, and assistance by older engineers.

The interest of older Engineers in those who are just starting on their careers is real. The New York Society of Professional Engineers, in its Code of Recommended Fees and Salaries, has established a minimum recommended salary of over $3,000 a year for Engineers-in-Training. It welcomes Engineers-in-Training to all its meetings and to membership participation. In addition, guidance groups have been established, and refresher and coaching courses are given for the professional examinations as well as other group courses for personal and professional development. State after state has adopted similar policies and procedure. The cooperation of older and younger engineers has proved mutually helpful and stimulating, strengthening professional consciousness, professional relations, and professional ideals. With strengthened feelings of solidarity and mutual obligations, the foundation is laid for a stronger and greater engineering profession.

There have been many other valuable by-products of Engineers' Registration, notably in the fields of public relations, legislative relations, and interprofessional relations.

Through the necessities of securing and progressively improving and strengthening Registration laws, Engineers have had their interest in legislation and legislative procedure awakened and strengthened. Engineers have come to feel at home in legislative halls and at public hearings on legislation. An increasing number of Engineers have been elected to legislative bodies. Engineers have learned to take a part in the drafting of legislation, and they have learned to be alert to all legislation affecting the public or the profession in engineering matters. They have come to know legislators and public officials in relations of mutual confidence and respect. Engineers have become legislation-conscious. Above all, Engineers have overcome their reputation of being mute and inarticulate and have become effectively vocal and eloquent in recording the profession's objectives and ideals.

From active participation in state legislation, there has been a natural carry-over to national legislation and to municipal and civic problems. In discussions of public improvements, building codes, civil service standards, and appointments to official positions, Engineers have come more and more to take an active voice and to have their recommendations carry weight.

One of the most valuable dividends of Engineers' Registration has been in improved relations with other professions. We have had our legislative battles, but these have been terminated with harmonious agreements of mutual cooperation and respect. The enactment of our Registration laws placed us on an equal footing. Through problems shared and common interests, we have come together with other legally recognized professions around the council table, for joint formulation of policies and programs—in legislation, in civic affairs, and in the public weal. Prior misunderstandings antedating Engineers' Registration have given way to the finest harmonious relations. Registration was the catalyst that brought us together. Instead of expending our energies in mutual conflict and suspicion, we have agreed to unite our forces against the common enemy—the unqualified and the unscrupulous—and to work together as brother professions in mutual confidence and esteem.

All of these consummations were not achieved in a day. They required years of untiring effort, planning, and determination. We knew what we wanted to accomplish. Our faith and our vision have been rewarded.

Engineers' Registration is not yet perfect. There still remain some problems to be ironed out. But real progress has been made. Engineering societies and large industrial interests have been progressively won over to the cause. In group after group, we have seen opposition and disparagement change to neutrality and indifference, and these in turn to ardent conviction and enthusiastic support. Those of us who have dedicated our lives to the movement feel richly repaid in the results achieved. Our sacrifices and our scars have been the price of achievement for the Profession we love. We have planned and wrought, and in our own lifetimes we can see the fruits of our labor in a unified, recognized, and respected Engineering Profession. We recognize our debt to the Engineers of vision and achievement who preceded us, and we are passing that heritage on to those who follow us. We are only the temporary custodians of the traditions and the honor of our Profession. We must keep faith with our high obligation and we must pass our heritage along—not diminished but enhanced—as a greater, stronger and nobler Profession for those who come after us.

We who have been entrusted with the administration of Engineers' Registration bear a high responsibility, and we must carry out that trust in a spirit of consecration. In our hands have been placed the ambitions of young men, the confidence of the public, and the good name of our Profession. We must discharge that three-fold responsibility with loyalty and devotion, courtesy and fairness, vision and integrity. For through our performance we are determining who shall be the Engineers of tomorrow; and through our fulfillment we are giving shape to our vision of the Engineering Profession of the future.

President's Report—1950
C. L. Eckel

The National Council of State Boards of Engineering Examiners was organized in Chicago by twelve states with registration laws in November 1920. It, therefore, seems eminently appropriate that this, the Thirtieth Anniversary Meeting of the National Council, should be held in Chicago. The wide representation of member boards at this meeting is evidence of an appreciation of the need for improvement in the procedures contributing to the advancement of the engineering profession in its effort to serve the public. Just last month Congress passed and the President signed a bill providing for registration in the District of Columbia. Enactment of this law brings all of the United States territory into the fold. In passing it should be noted, however, that the Montana law applies

only to civil engineers and land surveyors, and that registration is optional in two states, Massachusetts and New Hampshire.

Long Range Objectives

From the very beginning the members of the National Council have believed that legal registration is important primarily in the interest of the public welfare and secondarily to the engineering profession. For this reason professional registration should not be dominated or monopolized by any individual, state board or other organization, and all registration activities should be developed and coordinated in cooperative effort to render a maximum service to the public and to the profession.

With this objective in mind, we must continue to work for the improvement in procedures in various states to facilitate interstate practice of qualified professional engineers. To this end, engineers in states which at present have low standards should work to bring local requirements at least to the requirements of the Model Law, and states which now have higher requirements cannot with logic insist that qualified engineers be required to meet requirements that may be discriminating. Higher standards for registration are to be desired, but the various states must move together in this direction.

A closely related problem is that of the Engineer-in-Training. Again everything possible should be done to facilitate interstate acceptance and recognition of the Engineer-in-Training.

A training program for young engineers which is now in effect in Ohio is of interest. Recent graduates are employed at a seemingly fair salary with promised increases in salary during the training period. Successive assignments in the major divisions of the highway department are made during the training period, and upon completion of the training, it is anticipated that the trainee will have acquired sufficient experience to meet the minimum requirements for registration in Ohio. A trainee, thus placed in a job of considerable responsibility, must stand on his own legs or fall. Under these conditions, his capacity for engineering responsibility should be easily determined. The older men in the organization—the division or section heads—must provide jobs with enough responsibility to enable the trainee to meet the state requirements for registration. This reminds us that the older generation has a definite obligation to help the young engineers achieve professional status.

The National Council should continue to direct its efforts toward uniform requirements and maximum facility of interstate endorsement for both the professional engineer and the Engineer-in-Training. Registration is now thoroughly recognized. Even its opponents admit that it is here to stay. It is quite clear, however, that continued and perhaps even more extensive cooperation between the states is the one sure way to avoid the possibility of federal registration laws.

Operation

Individual members of the Council make their contributions largely through committee work. Each committee spearheads an important activity of the Council. Every effort is made to obtain proper, adequate, and interested representation on each committee. May I urge that each committeeman give his best effort to the functioning of his committee during the coming year.

In an organization such as ours, the elected officers come and go; the organization itself functions largely through the Secretary, who must direct and guide numerous activities. A year ago, I thought I had some appreciation of the problems and calls made on our Executive Secretary for various types of services. Let me say that I now know that actually I had little comprehension of the variety of requests and demands that are directed to the office of our Executive Secretary.

A brief report on my visit to the Secretary's office was made in the June issue of *The Registration Bulletin*. I was pleased with what I saw and I can assure you that the day by day business of the National Council is in competent hands. The cooperation and assistance afforded me during the past year by the Executive Secretary and his office could not have been surpassed.

I should like to call your attention to *The Registration Bulletin* which as you know is issued four times a year. This *Bulletin* permits an exchange of information between Board members and can be just as valuable as we desire, but this *Bulletin* cannot be dreamed up over night by the Executive Secretary. Its value will be greatly increased if Member Boards and individual members of Boards will supply appropriate articles for publication. Please give this matter serious thought.

Last month I received a letter from Mr. S. A. Bauer, President of the American Congress on Surveying and Mapping. Mr. Bauer praised the report of our Committee on Land Surveying in which distinction is made between land surveying and engineering surveying. It may also be interesting to note that the American Congress on Surveying and Mapping printed our committee Report in the January-March 1949 issue of its Journal. Mr. Bauer commended the attitude of the National Council in this matter and expressed the hope that various State Boards may be able to incorporate the distinction our committee made between these two branches of surveying within their interpretations of their state laws.

Finances

On Aug. 7, 1950, I received directly from the public accountants, the report on the audit of the Executive Secretary's books for the period July 1, 1949 to July 1, 1950. Copy of this report is included in the Executive Secretary's report. The finances of the Council seem to be on a sound basis. State Boards are generally able to contribute to the support of the Council on the basis of the scale of fees adopted in 1946. As a result of past careful administration procedures, it was possible to transfer $5,855.06 to the Reserve Fund on Jan. 5, 1950. This transfer brought the Reserve Fund to $12,000.00, which with interest amounted to $12,150.00 on June 30, 1950.

All but a few states are now paying dues in accordance with the 1946 formula and during the past year a majority of the Member Boards were able to make the suggested $25.00 contribution to ECPD. For various legal reasons, a few Member Boards were unable to make their full contribution to the Council or to further support ECPD; however, there are still some states apparently with funds but not paying according to schedule. These Member Boards are in good standing, but in order to avoid any possible misunderstanding about the status of these states, I should like to remind you of Dean Butler's comments of a year ago, relative to the functions and purposes of the National Council.

Engineering Society Support

Proper acknowledgment should be made of the continued interest of national and state engineering societies in the National Council. This interest is evidenced by the attendance of official representatives at the Annual Meeting of the National Council, and the financial support afforded by some of these organizations. At Daytona Beach, it was indeed heartening to hear Colonel C. E. Davies say that the $500.00 which the American Society of Mechanical Engineers budgets for the support of the National Council is for value received. We shall continue to try to provide service of significant value to the National Societies.

The Engineers' Council for Professional Development renders important service to the various State Boards of Examiners. Accordingly it is proper for the various Boards to show their interest in ECPD. During the past year, the response of the State Boards to the support of ECPD has been excellent. You will no doubt recall that the action taken at the last Annual Meeting suggested a

contribution of $25.00 or more to ECPD, "for value received." To date, either by direct contribution or through the National Council, a total of $930.00 has been contributed by State Boards to ECPD. Probably every State Board able to legally recognize this obligation has responded; however, a possible misunderstanding should be clarified. The action at Daytona Beach suggested a State Board contribution of $25.00 or more to ECPD over and above the National Council assessment. The annual State Board contribution to the National Council is for services rendered by the National Council to the state and is prorated among the several states in accordance with the agreement reached in 1946. Our annual budget is drawn on this basis. Although it was not the intent of the action a year ago, a few State Boards have deducted their ECPD contributions from National Council dues. If all states had followed this practice, National Council income would have been materially decreased.

Service of Members

In passing, I think it appropriate to call attention to a remarkable list of members of the National Council who have given long and devoted service to their respective State Boards. Eleven past presidents of National Council are in attendance at this meeting.

One of these, Dean G. M. Butler, has served continuously as a member of the Arizona State Board of Technical Registration since 1921, when the Arizona law was enacted. Dean Butler is the senior past president of those who are now members of National Council. He has rendered distinguished service to the engineering profession on many occasions.

A more recent past president, John C. Remington, has served as a member of the New Jersey State Board of Professional Engineers and Land Surveyors for 29 years. Although he expected to be present, a serious illness prevented his attending this meeting.

Dr. Donald Derickson, President of the Louisiana State Board of Engineering Examiners, has served continuously on this Board since his appointment in 1917. It is believed that this record of 33 years service is the highest for National Council members. Dr. Derickson is professor of civil engineering (emeritus) at Tulane University. We are sorry that he is unable to be in attendance at this meeting. M. C. Hinderlider is State Engineer of Colorado and has been secretary of the Colorado Board for 27 years.

To date, but not including the meeting, we have awarded 31 Distinguished Service Certificates. Eighteen of these men are still members of State Boards, and it is believed that eleven of these are in attendance.

The second senior past president, still active in registration procedures and present, is none other than our Executive Secretary, T. Keith Legaré. Keith attended the meeting of the National Council in 1922. He was elected Secretary in 1923 and has attended twenty-seven consecutive Annual Meetings. Keith has given twenty-seven years of devoted service to the work of the National Council.

Conclusion

At this time I want to express my personal thanks to members of the Board of Directors for their loyal assistance, and to all chairmen and committee members for their excellent work during the past year. I also want to thank the Executive Secretary and his assistants for their able and conscientious work, and especially for their patience and understanding. This same splendid cooperation will be carried on by the members of the National Council—engineers who are willing to devote large portions of their time and energy to the advancement of the engineering profession with no compensation save the satisfaction that accompanies good work well done.

History and Accomplishments of NCSBEE
By N. W. Dougherty, Past President
Address at Banquet, Annual Meeting, Oct. 10, 1950

The history of the National Council comprises a very recent chapter in the chronicles of the engineering profession; so recent is it that we have men present who organized this Council and set in motion the long series of events which bring us here tonight. For countless millennia men have been doing engineering works; they have been constructing buildings; they have been digging canals; they have been boring tunnels; they have been making and operating machines; they have been constructing engines of destruction; they have been building bridges, and doing a hundred and one other things necessary in a world which has drifted, waded, sailed, and bent its back to the wheel in order that civilization of today might come into being. From Tubal Cain, of the Genesis, to the engineers in this room there have been thousands of men and women who have put their hands to the task of building an industrial world.

Thirty years are almost a professional lifetime of a practitioner, but it is merely the beginning of an organization. The National Council is one of the younger members among similar organizations; it was preceded by the National Association of Dental Examiners in 1883; the Association of Medical Examiners and Licensing Boards in 1892; the National Association of Boards of Pharmacy in 1904; its twin, the National Council of Architectural Registration Boards was organized in 1920 and the National Conference of Bar Examiners came in 1931.

When some of our honor guests of the evening were meeting here in Chicago thirty years ago, they were doing for engineering what had been found desirable for the other professions. It is a noble thing to conceive an idea and to see it develop into something of great value and usefulness. Tonight we have two men with us who were present at the organization meeting of the National Council; they were not delegates, but interested participants in a movement to launch an organization which now includes the District of Columbia; three territories and the forty-eight states. On Nov. 8, 1920, delegates from Colorado, Michigan, Iowa, Florida, Louisiana, South Dakota and Illinois met and organized this Council, though South Dakota with a law for land surveyors and Illinois with a law for structural engineers only did not continue as member boards. Mr. T. L. Condon a member of the Illinois board and Mr. W. W. DeBerard, who was an associate editor of *Engineering News-Record*, were present then and they are with us tonight. Through the years they have been able to see "what a great fire a small spark kindleth." Mr. L. M. Martin, whom many of you knew very favorably, was to be with us but he was not spared to be present on this occasion; he labored long and faithfully in the organization he helped to found.

Again one year later and two years later the newly created Council met in this hotel to continue the work begun at the organization in 1920. You know some of the pioneers of these early meetings; G. M. Butler of Arizona, H. D. Mendenhall of Florida, and T. Keith Legaré of South Carolina, have been pillars of strength in the deliberations of the Council for nearly thirty years. In 1923 Legaré was elected secretary and he has served continuously since that time except for the year 1930–1931 when he served as president of the Council. Dean Butler served as president of the Council in 1923–1924 and through the years he and Mendenhall have served with distinction on the working Committees. The job we gave Legaré placed him in a position to do many services for the Council. During the twenty-seven years he has been in the fore-front of engineering registration; he has been the sparkplug of this organization; he has done more than any other man to get uniformity in legislation; he has presided over the writing of the Model Law; he has told more shady jokes than all the other

members. Butler and Mendenhall have not been privates in the ranks but captains of policy and action. Those of you who were at Daytona Beach last year remember Butler's excellent statement regarding the Council and Mendenhall's masterly handling of the banquet and the report of his committee at the business meeting.

The minutes of the 1923 meeting show wise statesmanship on vexing questions which were before the states at this early date. Should registration be optional or compulsory? The vote of the delegates was that it should be compulsory; this has been the trend in practically all the states. Massachusetts and New Hampshire, I believe have optional laws. Another question was "Should registration certificates show the branch of engineering?" The answer was NO, and this was a very wise decision.

By 1922 fifteen states were members of the Council as follows: Arizona, Colorado, Florida, Illinois, Indiana, Iowa, Louisiana, Michigan, Minnesota, New Jersey, North Carolina, South Carolina, West Virginia, and Wyoming. This is quite an array of staunch supporters of the Council, whose representatives have always been very active in its deliberations.

We shall undertake to recite our story as a combination of history and anecdote combined with a statement of the aims and objectives of the Council. I use the term history in spite of the definition: History is something that never happened, written by a man who wasn't there.

Let me pause to say that engineering registration is of comparatively recent origin. In the United States it began with the passage of a law in Wyoming in 1907; the roll of the states was completed with the passage of the Montana law in 1947 and the District of Columbia law in 1950. Many of those here present have personal knowledge of engineering during the whole period. I was a student in college during the beginning stages of registration, and my teaching career has extended over the last four decades of its development. You may be interested to know that neither the organizers of this Council or any other engineer now present had to do with the first laws governing design and construction of buildings. Some time ago I was making a study of laws regulating our profession and found an old statute which reads as follows:

> If a builder erect a house for a man and do not make its construction firm, and the house which he built collapse and cause the death of the owner of the house, that builder shall be put to death.
>
> If it cause the death of the son of the owner of the house, they shall put to death the son of the builder.

The latter clause probably marks the time of the law; it was in the period of an eye for an eye and a tooth for a tooth. Some eighteen centuries before the beginning of the Christian era Hammurabi promulgated a code of which the above laws comprise sections 229 and 230. Since 1800 BC there have been laws to protect the safety of citizens from the wanton acts of other citizens who held themselves out as having special qualifications. But to legally certify competence in advance of practice is a comparatively recent origin. About eight hundred years ago the professions had the beginning of legal registration when Roger, the Norman king, required doctors to have a certificate of competence before they could practice medicine. Medicine in America as well as engineering was practiced by all who could get clients until the days of our fathers. Now let us continue our story by recounting some of the accomplishments of the National Council.

First of all, the Council has been a forum for free discussion and the exchange of ideas. None of its actions or recommendations can be binding on any state board; each board is autonomous and

must act under its own law and cannot delegate its necessary functions to any other agency. Boards can, however, use information and procedures suggested by other boards; they can cooperate with each other in gathering information, in exchanging ideas, and in getting uniformity. The Council is not a union whose majority action is binding on all the members; it is a loosely knit association for the benefit of all its members. Missouri can require a written examination of all applicants and Tennessee may require very few written examinations and both boards can be members, and get benefit from membership. Massachusetts may have an optional law and New York may require registration of all who practice engineering and both states be members of the Council; Kentucky may register by engineering specialties and South Carolina may work under the Model Law and both states be members in equal standing.

As we meet from year to year we get acquainted with members of other state boards; we learn the motives and objectives of our colleagues, and we go home with a better understanding of our many problems. Ever and anon we hear an inspirational talk like that given by Dr. Steinman last year and we take pride in being a part of a great movement. If we never passed a resolution, or accepted a report of a committee it would be worth our time to talk registration with others interested in the activity. But our proceedings are filled with reports of committees; its pages are laden with resolutions; and each meeting has its quota of animated discussion.

One day we laid the cornerstone of a monumental gate guarding the entrance to the University. In one of the stones was a copper box in which current documents were deposited for the edification of some future generation which would destroy the edifice. A student was given the task of depositing a catalogue of the University. He said: "here is the catalogue of the University; written by the president, read by the deans and ignored by everybody else." You may say; "here are the proceedings; written by the committees and Mrs. Beck, edited by our Secretary and placed on the bookshelf of everybody else."

At the very first meeting of the Council the problem of uniform legislation was discussed. Uniformity is a problem today, after thirty years of discussion, but we would not have it otherwise. Few in this room would be willing to place registration in the hands of a national bureau, to perpetuate mistakes in all the states. Our experience with interstate registration has warned us that boards are not infallible and that the shyster needs a check and a double check. We get most of them on the first application but now and then a slicker gets by.

Uniformity will be achieved in the spirit of our procedures long before it will be achieved by identical laws. We can all agree on the principle that the competent should be certified from state to state and that the incompetent should not be certified in any state. We all know that competency to do highway work in Tennessee does not qualify to do the Empire State Building in New York. Under the American system, each state must be responsible for the exercise of the police powers of the state. It is not the duty of Tennessee to dictate to any other state, neither is the duty of any other state to tell Tennessee how to regulate its professions, but each of the states can be helpful to all the states by doing its job well.

Experience is a great teacher. In the early days of the Council the members thought the passage from state to state should be very easy. They entered into an agreement that each state would issue a certificate showing that the registrant had met the minimum requirements of all states entering into the agreement, and this certificate would be satisfactory evidence of competence. The certificate took the form of a small identification card which could be carried in the billfold. When it was presented to a state board the board would issue a certificate of registration giving the holder

all the rights, privileges and prerogatives of a resident who had filed a more formal application. This simple method had a very short life. Attorneys general advised the boards that they were delegating their authority and such delegation was bad legal practice and would not be countenanced by the courts. In addition, the boards were new at interstate registration and did not take their task as seriously as they should. By 1930 there was criticism of the calling card certificate, because some certificates had been carelessly issued, and by 1932 the Council abandoned the method.

In the mean time a new proposal was presented, namely, the National Bureau of Engineering Registration, which was discussed from 1930 to 1932 and was adopted at the convention in 1932. The Bureau concept was much more extensive than the reciprocal registration cards; it would certify experience and educational records of engineers who were seeking registration in the states, membership in a society, or possibly, seeking advanced degrees. Again, experience has taught that the societies prefer their own devices for gathering information on applicants, the educational institutions have sacred procedures of their own, and the state boards use the Bureau at arms length.

Since I have had service on the Bureau committee let me place a plug for its work. At Salt Lake City we spent a large part of one session discussing its work, and there appeared to be some misapprehension about its certificate. Let me say that the Council sets up the specifications for the certificate and the Bureau follows the specifications; the state boards determine the use which may be made of the findings. The Tennessee law makes a specific provision which allows us to accept the certificates as competent evidence of qualification; other laws have similar provisions. There is no desire on the part of the committee to usurp any of the prerogatives of the state boards; we merely wish to help with the work, if that is possible.

Another major activity of the Council has been the promotion of uniform laws. The civil engineers have been conscious of this problem, almost from the beginning of registration, and they have been leaders in the movement to get uniformity. As early as 1911 a committee of the civil engineers wrote and published a proposed model law. American Engineering Council sponsored a law in 1919 and the American Association of Engineers wrote one in 1920. In 1929 the National Council threw the weight of its influence with the civil engineer's law and since that date the Council has been actively represented in each new writing. Other engineering societies joined the civils during the late 'teens and continued their cooperation after the Council was brought into the picture. A Model Law was adopted in 1932 and from time to time it was revised until the last issue was made in 1946. Our Secretary should be given great credit for the achievements of this joint committee; he acted as chairman of the committee for each new writing of the Model Law.

By 1930 the Council had come of age; it had explored many facets of engineering registration; its member boards had developed a need for a list of "satisfactory engineering schools." In 1928 the Council had adopted Dean Daggett's list of accredited engineering colleges, but the list was not satisfactory. Some of the schools were strong in one field and woefully weak in others, thus making it desirable to accredit curricula, rather than colleges. This would mean a very elaborate procedure.

By 1932 there was a movement to get joint action of the societies on professional matters. The National Council joined with representatives of the Founder Societies, the Chemicals and the SPEE in organizing Engineer's Council for Professional Development, an agency to promote the professional welfare of the engineer. The representatives of the Council urged an accrediting procedure which would furnish state boards with needed information about college curricula, and thus give the boards a list of "schools satisfactory to board." Representatives of the state boards were placed on the inspection committees, a member always sat on the general committee of ECPD, thus

giving weight to the position of the Council in accrediting procedures. The work on ECPD has been very worth while; the list of accredited curricula has been very valuable, and this brought the registration movement to the attention of all the major engineering societies. Shortly after the formation of ECPD the Engineering Institute of Canada was admitted as an active member thus extending the influence of this Council to the Dominion of Canada.

To 1932 the National Council had acted as a loosely organized Council or forum for discussion. At the annual meeting of 1932, Olaf Laurgaard of Oregon was elected president of the Council; he took as his task the preparation of a constitution and by-laws, and these documents were adopted at the 1933 meeting. A more formal organization did not add to the Council's abilities to serve the several members, neither did it take away any of its prerogatives. But having a constitution and by-laws did give a better understanding of the aims and objectives of the Council and it has stabilized our organizational and committee structure.

Committees of the Council perform a vast amount of painstaking work; they have engaged the attention of hundreds of members, and they have helped to form joint judgments of many vexing problems of the Council and the individual boards. Because of the autonomy of the state boards, committee reports are adopted in principle and not as binding agreements which restrain the boards from independent action. Large stores of information have been gathered, good practices have been studied and voluminous reports have been printed; all of which tend from year to year to get more uniformity and better understanding of our joint problems.

For example, committees have studied examinations, oral and written, from the time of the late twenties; they have made many sound recommendations but there is a limited amount of uniformity. However, all the study has not been in vain; here an idea and there a practice has been adopted, all tending to make for better procedures to get a measure of competence.

A determination of competence is the objective. As soon as the members of a state board decide that an applicant is competent to practice they are duty bound to register him without an initiation ceremony or any type of ordeal. We expect differences in procedures to determine this fact. In Tennessee we may examine a dozen borderline cases at a meeting; in New York or Illinois the board may examine hundreds of applicants at a meeting. The difference in numbers will require differences in methods of examining applicants.

Some may believe that competency may not be determined without a written examination; others may believe that a written examination is a very poor tool to determine ability. All of us realize that written questions may detect lack of knowledge or information about a specific problem, and all of us know that no examination can measure "will to do" or that most valuable of all qualities, integrity. Written examinations must be combined with other information to allow a board to form valid judgments of ability, responsibility, and integrity. These are the essential qualifications for professional practice. The National Council and the state boards must find ways to promote, as well as discover competence, integrity, and willingness to take responsibility. Any device which will distinguish between the competent and the incompetent is a device which should be used; any ceremony or regimen which does not contribute to this objective should be abandoned. It is not the function of any council or state board to subject applicants to initiation or to an ordeal to determine qualifications. When we are discussing examinations I think of a line from the Rubaiyat:

> Myself when young did eagerly frequent
> Doctor and Saint, and heard great argument

About it and about: but evermore
Came out by the same door where in I went.

Our Committees should continue their work; they should report practices from year to year and as time goes by we will get more uniformity and develop better understanding between the state boards.

One of our major problems, during the years, has been a source of revenues adequate to finance Council activities. State agencies which have to pass review of economy minded budget directors will have trouble unless contributions to the Council are spelled out in the law. The nature of the Council is such that dues are not necessary for membership, yet to continue Council activities some funds must be made available. The present schedule of dues, devised by Mr. Blair of Florida, now past President Blair, and adopted at the St. Louis meeting is not entirely satisfactory, but dues, contributions from the societies and an economy minded Secretary have made it possible for the Council to make ends meet. Considering the large sums of money that are collected under the registration laws from year to year, there should be available funds for any reasonable activity. Since, however, members of the Council are state agencies, its work is probably sentenced to a life of modesty if not a life of poverty.

The future of the registration movement is very bright. It has been solidly established on a sound legal basis and there have been enough court decisions to show the most confirmed skeptic that registration has a real place in building an engineering profession. Last year Dr. Steinman pictured the progress of the movement, he led us through the obstacles which have been encountered and he pointed to the successes which had been achieved. We can take pride in the movement. Engineering registration began in Wyoming in 1907 and the roll of the states was completed when Montana passed a law in 1947; this meant forty years of pioneering or a professional lifetime of legal activity. By the second decade of registration the National Council was born and during its thirty years of life it has done many constructive things to help the movement. It can do more. We still have many problems in procedures, in writing and rating examinations, in certification from state to state to state and, in some cases, we can make it much easier for the competent to pass from state to state.

This council can use new blood. Younger members should take an active part in these meetings; they may say something that has already been said but they will also say something that the oldsters have left unsaid. New members will present new ideas which have not had consideration during the years of battle to get a job done, but ideas which come after we began to occupy the land. We Americans take some pride in ancestry, and all of us thrive on hope for posterity. This council has done enough to justify its organization and support; its future is as bright as we, who are here, wish to make it. "Where there is no vision the people perish": where there is not initiative a Council will go to seed and waste away with other obsolete organizations. Thirty years ago far-seeing men brought this organization into being; its future rests in your hands, to make it what you will.

President's Report—1951
R. G. Warner

Each of our fifty-two autonomous Boards are set up to protect the health, safety and property of the public. We, members of the engineering profession, have been appointed to police our profession for the benefit of the public. This requires setting minimum professional standards for those who would practice engineering. In Article II, our Constitution states in part "The purpose of this Council shall be to promote the public welfare by improving professional engineering standards

through efficient administration of State Engineering Registration Laws." It is an honor and a responsibility to be one of the three hundred Board members giving so much time and thought to maintaining the standards of our engineering profession. The work you are doing is being recognized throughout our profession.

It has been my good fortune to represent the National Council at several annual meetings of engineers including the Dominion Council of Professional Engineers in New Brunswick, Canada, The American Society of Mechanical Engineers in New York, the Engineers' Council for Professional Development in Cleveland and in Boston, and the National Society of Professional Engineers in Minneapolis. At these meetings and at other engineering meetings there has been a sincere appreciation of the registration work being carried on by our fifty-two Member Boards.

For example, in an ECPD committee considering uniformity of membership grades, it was proposed that registration be accepted as evidence of requisite experience. It was pointed out this could not be adopted without qualification because the requirements for registration in a few states were not considered sufficient. The AIEE in adopting the newly recommended grades of membership recognizes registration in some forty states where the requirements for registration are at least equal to those of the Model Law. Again the American Society of Civil Engineers urges that Engineers-in-Training examinations be given at places convenient to the neophyte engineer starting on his experience career.

This recognition of engineering registration is important and it emphasizes the need for obtaining greater uniformity in our laws and procedures. It is hoped that this goal will be stimulated in this meeting through consideration of our committee reports, through discussion of our mutual problems and through more friendly acquaintance with members of other Boards. Thus we will carry out the objectives of this National Council and at the same time render a valuable service to our engineering profession.

Committees—A most important phase of the Council work is that of its various committees. The reports as published through the years make a valuable contribution, providing ways and means for obtaining closer uniformity among the various Boards. The reports this year continue the high caliber that has been set in previous years and I would like to express my thanks and the thanks of the Council to the committee members and the chairmen who have so graciously given their thoughts and time to the preparation of these reports. And may I urge each of you to carry out your committee assignment this coming year with diligence.

I feel that our thanks should be extended to the Special Committee under the chairmanship of Professor Knipmeyer which has considered ways and means of showing our appreciation for past, present, and future services of our very capable Executive Secretary.

Finances—Through the continued careful management of our Executive Secretary our expenses have been kept within the budget and our income has been sufficient to pay all bills and leave a small amount to be added to the reserve fund. This reserve fund has been accumulated through the businesslike operation of the Council and it seems to me that it is desirable to have such a reserve and that the amount in it should increase to an equivalent of about one year of operating expense.

The financial help of the engineering societies to the Council has been a life saver through the years. The moral support has been fully as helpful. It was gratifying two years ago to have Col. Davies point out that ASME was paying "for value received." We trust that we will be worthy of such continuing support from these engineering societies.

The present scale of fees for the Member Boards was developed a few years ago by a committee headed by Carl Svensen, which presented a graph prepared by Alec Blair. Some have felt that the

fees charged the Member Boards should be in direct proportion to the number of registrants. Others that the fee should be a flat amount for each State Board. The scale that we adopted is a judicious compromise of these two views and seems particularly equitable to me. It is hoped that the number of registrants and consequently the income of the Council will increase sufficiently to take care of the effects of inflation which are causing increases in operating expenses. Forty-one of the States have paid their full share according to the schedule. At least one more will before the end of the year. We recognize that varying financial procedures handicap full payment from certain States. However, it is natural for the forty-odd Boards that are paying their full dues, to expect the others to do all in their power to find ways and means to pay their share of expenses to the Council.

As you know the accounts and bills, etc., of the Council are audited each year by independent accountants. I received direct from the auditors a certified statement that the annual audit had been made and that the accounts and bank balances were in order.

Uniform Procedure—There is a sincere effort among the Boards to make their procedures more uniform. These meetings with their discussions and through the friendships formed help to make for greater uniformity. The Zone meetings held at the time of the annual National Council meeting and those which are held between times all contribute to greater uniformity of procedures. It was of interest last year that both the Northeast Zone and the Southern Zone independently adopted procedures for an interchange of examination papers with the expectations that by knowing more about the type of examinations given by neighboring Boards a greater uniformity in scope of the Examinations would result. The tentative syllabus of examinations prepared by Col. Spann's committee should provide another tool to greater uniformity. It would seem reasonable for adjacent states to work together on common examinations, particularly for Engineers-in-Training.

Interstate Registration—A major objective of this Council is to facilitate "interstate registration of engineers." Greater uniformity of requirements and procedures help to simplify registration in other states. Certainly we want to reduce legal entanglement to a minimum. Dr. Steinman has said, let us make it easy for the competent engineer to be registered, and he has actively participated in showing ways of accomplishing this.

The Certificate of Qualification issued by the National Bureau of Engineering Registration is particularly useful to the engineer desiring to register in several states. The present high standards of competency required for such certification commends it to the Member Boards as evidence worthy of consideration. When our Board receives an application from an engineer whose record has been verified by the National Bureau, we carefully review the record but accept the certification of practical and educational experience and the statements of references, eliminating considerable correspondence with consequent delays.

Engineers' Council for Professional Development—The Member Boards of the National Council are indebted to the various committees of ECPD for their work on professional development. Particularly we are indebted to the work on accreditation which has been so well handled for several years. Certainly this has been a real contribution toward uniformity of procedures among the State Boards and the basis of accreditation is sufficiently broad to permit each school to develop its philosophy of education as it feels would be most effective. Yesterday two of our committees met with members of the ECPD Recognition Committee and the ASCE Committee on Registration to consider the needs for changes in the Model Law. Other committees of ECPD are guiding the future engineer, before, during and after his college course. These activities fit in closely with our work of registration and many of our Board members are now serving on these ECPD

committees. We should all become familiar with them. I am pleased that the National Council is one of the sponsoring groups and that the State Boards in recognizing the value of ECPD have increased their payments to it. This year approximately $1000 have been paid by the Member Boards of the National Council to ECPD.

Looking Ahead—It behooves each of us individually and collectively to review our activities from time to time to be sure we are working toward our desired goals and particularly that the procedures we are following are effective. This morning I have referred to the purposes of our National Council and have indicated that our activities are directed toward furthering these purposes. However, I raise the question as to whether we should reappraise our activities.

Should we have a committee review our procedures looking to the future? Such a committee would consider any suggestion from any member of a Member Board. After due consideration, this committee would report its conclusions to the Board of Directors, indicating as to the changes, if any, which it deemed worthy of modification.

Appreciation—I would like to record my thanks to the Board of Directors and to the Committees for their guidance and careful work for the benefit of all of us. And I am sure that without the guidance of T. Keith Legaré neither I, nor the Board of Directors, nor the Committees could have been nearly as effective. His background and continued checking keep the Council functioning as it should.

It is also quite appropriate for us to record our thanks to Dean N. W. Dougherty for his booklet on "Engineering Registration." He has made a real contribution in reviewing the background and the development of engineering registration and has indicated the part registration is playing in unifying and developing a professional attitude among the engineers.

President's Report—1952
C. S. Crouse

Our organization consisting as it does of a somewhat loosely knit group of fifty-two perfectly autonomous local boards is different in its set up from any other of the general engineering societies. Your national officers have no inherent or other powers to do anything but suggest. They cannot impose rules and regulations nor can they enforce the collection of funds to operate the Council. In short, this organization, if it operates at all, must function through a mutual understanding of our common problems, through a considerate appraisal on the part of all Boards of any problem peculiar to an individual Board, and through the fullest desire to cooperate on the part of everyone.

This situation makes the duties and effectiveness of your national officers rather nebulous. What they may actually accomplish is intangible and may take considerable time to become evident. As a consequence any report of your President must be factual, that is a report of what he has done or attempted during his term of office, with such suggestions as he may have for the future.

As many of you may know I have been the Member-Secretary of the Kentucky Board since its formation in 1938 and I early started taking a vital interest in the work of National Council because I felt, as we all must feel, that only through meeting together so that we might get to know one another and through the earnest and careful discussion of our mutual problems could progress be made.

I am frank to say that in some of the earlier National meetings that I attended it was very difficult to see any progression because of long and often acrimonious debate on matters that seemed quite trivial. That there has been advancement during the years is now apparent because I know that the attitudes of the Board members now is greatly different from what they generally

were then. There is a much greater appreciation of individual problems and what is probably even more important not only a willingness but a desire to understand the other fellow's problem and to try and compose any differences that may develop in a spirit of give and take. This is surely the only way in which an organization such as ours can ever justify its existence and that it is now doing so is a great tribute to the many truly professionally minded men who have given so generously of themselves to bring this result about.

Due to the fact that I, like all of you, must make a living, I have not been able to get about the country during the past year as much as I would have liked. Nevertheless, I did spend three days with the Executive Secretary at Columbia and found everything at the Headquarters Office to be in excellent shape. I also attended the interim meetings of both the Northeast Zone and of the Central Zone as well as a regular meeting of the New York State Board and a joint committee meeting considering the necessity for revision of the model law. At both the Zone meetings there were enough Directors present so that informal Director's meetings were held and matters discussed that could be handled in that manner much more effectively and more quickly than through correspondence.

I was most cordially invited to attend the annual meeting of the Dominion Council in Quebec and I want to take this opportunity of expressing my great appreciation for the splendid way in which Ned Spaulding represented Council when I called upon him at literally the last minute. I also want to thank Bruce Williams for representing me at the annual meeting of the National Society of Professional Engineers at Tulsa which I was not able to attend.

When I took office there were two things that I had specifically on my agenda. One was that I felt that there should be a closer liaison between the Engineer-in-Training Committee especially as it affected examinations and the Written Examination Committee as the examination pertained to professional licensing. This has been brought about through the willing and active cooperation of the committees concerned from both of whom you will hear later. The second item was to give all those who desired an opportunity to make suggestions, recommendations or criticisms of the workings of National Council for the purpose of more nearly bringing our procedures to what you, as a whole, wanted. With this in mind I appointed a special committee with Past President Warner as Chairman and consisting of all of the other active Past Presidents with the exception of Secretary Legaré. You will hear from this committee later, also. The opportunity has been given. If any one of you has not taken advantage of it he has no one but himself to blame.

As I think you know and because of my own experience in the Central Zone I am a very strong believer in interim Zone meetings and sincerely hope that this practice will continue and spread. It is one of the best if not the only effective way in which problems may be brought up and discussed prior to our annual meetings.

In this connection I want to mention three problems that were considered at the Northeast Zone meeting which are vital to all of us. They were further discussed at the Central Zone meeting and I will discuss them briefly with you now with the recommendation that they be followed up during the coming year.

There was a definite criticism of the tendency of the Colleges to offer and of ECPD to accredit courses which might not strictly speaking be considered of engineering caliber but, relating as they do to closely allied interests such as business, physics or agriculture might be called fringe courses. In fact there seemed to be a tendency on the part of some Boards to discredit the entire ECPD accreditation program because some of these courses had obtained accreditation. As a member of the Executive Committee of ECPD I forcefully called this situation to its attention as well as to the

attention of the Education Committee. I have also mentioned it in my report to ECPD from National Council. ECPD is fully aware of the facts and steps are being taken that should prove satisfactory to the Registration Boards. I am myself on two committees studying the situation, one of ECPD and one of the American Society for Engineering Education. National Council through its individual State Boards is vitally interested and should keep continuously in touch.

There are two other problems which are pretty well interlocked which were discussed at both Zone meetings. Stated briefly they are: how much credit for professional experience for licensing should be given for engineering teaching alone and its cognate problem as to what a young man who wants to enter the teaching profession should do with the pressure from College Administrators for advanced degrees on the one hand and the demand of the Registration Boards for professional experience prior to licensing on the other. As a result of the interest taken in the two meetings in these questions and because of their undoubted importance I appointed a special committee, of which Dean Seaton is Chairman, to consider these twin problems and you will hear their report later. I feel that this investigation will probably bear continuation.

There is one other point that I feel constrained to mention. I have felt for some time that there might be a growing tendency among the Boards to make the written examination the **sin quo non** of licensing. It is certainly a most useful aid in the determination of the applicants' qualifications but I sincerely believe that other considerations should be given commensurate weight. Let us not make a fetish of the written examination but, rather, use it only in its useful, proper place.

This, then, is what I have to report of accomplishment during the past year. That it is but little no one knows better than myself, I can only hope and anticipate that what has been stated may be continued and that your new President may have more of attainment to report when his term expires.

It is with a deep sense of appreciation and gratitude to all of you for allowing me to serve as your President that I begin the meeting that ends my term of office and I bespeak the sympathetic cooperation of you all to the end that the work in which we are all so vitally interested may prosper to the ultimate great benefit of the public, the health and safety of whom constitute the only justification for our existence, and of the entire engineering profession. (Applause.)

President's Report—1953
A. G. Stanford

We are bringing to a close another chapter in the long history of the National Council—an organization which is unique in this Country—a Country which has gone in rather strongly for the establishment of innumerable societies, associations, councils, and variously other named groups for the accomplishment of sometimes very definite and sometimes perhaps nebulous goals.

In referring to this organization as unique I do so in order to emphasize the difficulties confronting it. In a majority of societies, associations and councils, after the organizational work has been completed the group appoints its committees and goes to work with the understanding that any official action arrived at by the affirmative vote of a majority of its membership will be binding upon the entire group. With our National Council we have followed the usual pattern only through the point of the submission of reports and recommendations and from there on we depart radically from normal organization practice. As all, except perhaps some of the newer members of this Council know, this body has no power or authority to commit or bind any Member State Board to any action whatever as a result of our deliberations. We can only strive by means of cooperation, perseverance,

the exchanging of ideas, and the application of logic to the changing problems and requirements of those we serve, to bring about not only a willingness but, more important, a desire on the part of all of Member State Boards to individually seek always to improve registration procedures and to work actively to secure passage of amendments to Registration Laws, where necessary, to bring all such laws into a more consistent pattern. For maximum effectiveness this pattern need not necessarily be that of the perfectionist whose ideas of adequate professional qualification may be unduly prejudiced by his own individual ability and technical proficiency; nor should the pattern be that of those who may still look upon engineering registration as a necessary evil, further complicated by some difficulty in differentiating between the minimum qualification desirable to entitle a man to practice a profession and those that would be necessary to permit him to practice a trade. As a result we still have a wide divergence of opinion on many of the most basic concepts of professional licensure.

I cannot bring myself to believe that the life, health or safety of persons residing in one state or section of our country is any more valuable, or worthy of protection, than of those residing in any other state or section, nor do I believe that among professional engineering practitioners the per capita rate of dishonesty is potentially greater in one state than another. Also I do not believe an accusing finger can be pointed at any one state or group of states as having a monopoly on structural or other types of engineering failures, which have jeopardized the safety, health or lives of the public, and which were due to professional incompetence, regardless of the varying provisions of our engineering registration laws or the manner in which they are being administered.

As a matter of fact the number of engineering failures which are the result of professional incompetence and which have adversely affected the public is gratifyingly low and I imagine compares extremely favorably with the records of the other leading professions. This speaks well for the basic soundness of our engineering educational system, the end product of which combines adequate technical proficiency and the important elements of honesty and determination to do always what is right. I sincerely believe that today an overwhelming majority of engineers have these attributes and the operation of our engineering registration laws have contributed much towards bringing about this condition.

In reporting on my stewardship of the office of President of this Council you should first be highly commended for the able and energetic group which you elected to serve with me as Officers and Directors, and including Past President Crouse. These men have been extremely helpful in solving the problems that have been presented and their willingness to "pinch hit" for me on several occasions has made it possible for the Council to be properly represented at gatherings which your President found it impossible to personally attend. Particularly do I wish to thank Western Zone Director, Allen Janssen, for attending the Annual Meeting of the Dominion Council of Professional Engineers held at Edmonton, Alberta, Canada on May 27–29. Also, my thanks to Past President Crouse for representing the Council in my stead at the Annual Meeting of ECPD held in New York City on October 16, and to Past President Russell Warner for representing the Council at the Annual Banquet of the American Institute of Consulting Engineers, held in New York City on October 19. As in the past Executive Secretary, Keith Legaré, has also represented this Council on numerous occasions.

I am happy to report that during the past year, for the first time an interim Zone Meeting was held in each of our four geographical zones. I count it both a privilege and a pleasure to have been able to attend the Southern Zone Meeting in Birmingham, Alabama, on March 13–14, the Northeast Zone Meeting in New York City on April 18, and the Central Zone Meeting in Rapid

City, South Dakota on June 11–12. I greatly regret that I was unable to attend the Western Zone Meeting in Salt Lake City on August 24, as I had planned. A death in my wife's family, which necessitated my being in Buffalo, New York, prevented the Salt Lake City trip.

I feel strongly that interim Zone Meetings are worthwhile and hope that these can be made an annual event in each Zone. Two of the greatest benefits that I perceive from the Zone Meetings are, first, the possibility afforded many Board Members to attend their Zone Meeting who are not able to attend the Annual Meetings and who are thus given the opportunity of getting much closer to the common problems which are of major concern to all of our Member State Boards; and second, our Annual Meetings of necessity have full schedules which do not permit sufficient time for detailed discussions. It is my belief that many of the problems of the National Council can be resolved in a much shorter time if we take full advantage of the opportunity afforded in our Zone Meetings for carrying forward objectively the consideration of those matters which were not conclusively settled at the previous Annual Meeting.

Your Board is recommending for your approval in the Budget for next year the sum of $400.00 for miscellaneous expenses in connection with the Interim Zone Meetings. It is proposed that $100.00 be allotted as a maximum to each zone towards defraying miscellaneous expenses when such meetings are held. In the past these expenses have been handled by personal subscription or assessment of those attending the Zone Meetings. It is felt that such miscellaneous expenses are a legitimate part of the overall annual operating cost of the National Council since these meetings are also strictly for the benefit of our Member State Boards. I trust that the membership will concur in this opinion.

With more experience in the conduct of Zone Meetings the pattern for such meetings will take the form most suitable for each Zone. While the National Council, as a whole, should encourage and cooperate to the fullest in making these Zone Meetings a success, the decision as to whether a meeting should be of one or two days duration and whether the meeting should be confined strictly to business or should combine any social features can best be left to each Zone.

In the June 1953 issue of *The Registration Bulletin* is set forth the recommended procedure for Committee reports which your Board of Directors is recommending for adoption by the Council at this meeting. The procedure that has been recommended is taken from the Sturgis Standard Code of Parliamentary Procedure. In the past we have on many occasions operated rather loosely with regard to official action taken by the Council following the submission of Committee Reports, with little consistency in the wording of resolutions and of the implications generally recognized in Parliamentary Procedure. Not infrequently in the past have we had resolutions to adopt, approve, accept, receive or perhaps reject reports without regard to whether or not the report contains definite recommendations which require positive action by the Membership. In the first place, in the presentation of a Committee Report a clear distinction should be made between that portion of the report which serves only to convey information to the Membership and that portion which comprises recommendations for positive action. Separate action is then permitted on the two parts and, if the report contained more than one recommendation, it is optional with the Membership as to whether the recommendation will be voted on individually or in one or more groups.

We can easily simplify our procedure if we will word our resolutions so as to "receive" a report, in which case the Membership is not committed to any findings or recommendations contained in the Report. Separate action from the floor can then be taken on the recommendations.

As you know the program of this Annual Meeting has made definite provisions for the announcement of the 1954 Committees and for meetings on Saturday morning of the new

committees, or at least of those members of these Committees who may be here. This means that a considerable head-start can be made by each Committee in getting its work underway. Heretofore, a number of weeks have been required after each Annual Meeting before the work of the Committees could actually be gotten underway.

I would like to see favorable action by this Council on the establishment of a Standing Committee on Board Secretary Affairs. The work in our various Board Secretary Offices have many problems in common and undoubtedly many of these offices can profit by an exchange of ideas and through cooperation with other offices. The creation of such a permanent committee would, I believe, further the overall objectives of the National Council and that of interstate registration.

During the year it became necessary for the Board of Directors to take official action on placing the personnel of our Headquarters Office under Federal Old-Age and Survivors Insurance. For several years this matter has periodically come up and was never settled due entirely to conflicting rulings and opinions, given to our Executive Secretary by the Federal Authorities, on whether or not this organization is required under the Law to participate on a mandatory rather than an optional basis. On the final determination that the paid personnel of the National Council are required under the Law to be covered by Federal Social Security we then were faced with the requirement of paying over $1700.00 in back taxes and interest. Without going into detail as to the manner in which the problem was resolved I am happy to report that your Board of Directors was able to place our Headquarters operations under full compliance with the Law and without the payment of any back taxes or penalties.

There seems to be continuing feeling, on the part of some of our Member State Boards, that a change in the name of our "National Bureau of Engineering Registration" might be both appropriate and would contribute towards a wider acceptance of the services of this Bureau by some of the States which do not now recognize National Bureau certification in their interstate registration procedures. One of the arguments advanced against the present name is that the certifying procedure of the National Bureau is not actually on a National scale. Perhaps a similar objection could have been raised for many years on the name of our National Council itself, since it is only in the past few years that we have been accepted and recognized by all States and Territories. Others feel that the word "Certification" is more appropriate in the Bureau's name. I have no specific suggestions to make in this matter other than that it be explored objectively from the standpoint that anything that will make of our National Bureau of Engineering Registration a more effective and acceptable medium for the simplification of interstate registration would unquestionably be desirable. May I here add that the appreciable increase in the number of applications which have been received and processed by the Bureau during the past year as compared with previous years has been very gratifying. I feel that a major contribution towards this has been in the added publicity given to the services of the National Bureau by various technical publications, the technical and professional societies, and by some of our State Registration Boards. The Georgia Registration Board has inserted in its annual Roster, which also includes a copy of the Registration Act, a page setting forth briefly the services and functions of the National Bureau and informing those who may be interested as to the method for securing further information or application blanks for National Bureau certification. This I consider to be legitimate and worthwhile information to place before all individuals registered in our State, each of whom automatically receives a copy of the Annual Rosters. Some other states are doing likewise and wherever it is legally possible to do so I urge that still other

states use a similar means or any other adequate method of informing their own registrants of the National Bureau services.

During the past year activities seem to have taken on an accelerated pace among some of our Member State Boards and among some of the Professional Societies with respect to (1) the practice of engineering by corporations, and (2) the registration of engineers with long established practice.

On the first of these matters I am sure that I have a sympathetic feeling towards the problems of any of our Registration Boards. However, I cannot but be opposed to some of the efforts which are being made to brand corporations, per se, as being something evil and therefore beyond the possibility of regulation in the ways of ethical professional practices. It is rightfully claimed that a license to practice professional engineering is the personal property of the individual holder thereof; but it is further claimed that this individual property right should not be subject to the whims and caprices of an impersonal corporation, some of whose officers, directors or stockholders may be dishonestly inclined. This reasoning overlooks completely, it seems to me, the fact that the license to practice professional engineering is just as valuable, and impossible of fraudulent or unethical use in the hands of an honest and professionally minded individual, regardless of whether he is employed by a corporation or is self-employed as an individual or a member of a partnership. Have we reached the degree of regimentation in this country by which a man is automatically considered honest or dishonest purely on the basis of the type of business organization with which he is connected? God forbid! The advocates of the prohibition against practice of engineering work by corporations state that we should be like the doctors and the lawyers which further overlooks the fact that the development in this country, of professional engineering practices has introduced the necessity for entirely different types of organizations from those which practice medicine and law. Are we trying to imply that the practice of law, for instance, in this country is more ethical or honest than the practice of engineering just because few, if any, lawyers have chosen to carry on their practice under the corporate form of business? As a matter of fact, I doubt whether the public would care one iota or give any thought to whether or not their doctor or surgeon was a director, officer or employee of a medical corporation. I am further of the opinion that the reason the public is as well protected against the incompetent and the shyster practitioners in the medical and legal profession is more because these professions exercise greater vigilance and do a better job of policing its licensed and unlicensed practitioners than is done in the engineering profession, rather than because of the "ifs, ands, and buts" in the registration laws.

In our registration laws and procedures we should keep in mind that perhaps greater than 90 percent of the engineers in this country will always be in the employee category and that much of the engineering work will be done by individuals who are either employees of corporations or employees of partnerships rather than by the principals or individuals who themselves are in private practice. If there is any stigma attached to being a professional engineer employee of a corporation—as certainly is implied by some of the publicity given to this controversy—then perhaps we should drastically alter our registration procedures and cease to encourage or require registration of any engineers except those who are the owners or the principals of design and consulting engineering organizations in private practice or those who aspire to be in this category in the future.

I am heartily in favor of the requirement that those individuals in any partnership or corporation who are in responsible charge of design work should be registered and it is also desirable, from a professional standpoint, that as many others who are qualified and who work on design projects to likewise be registered. I feel confident that it is possible to frame our registration laws in a manner

which will permit the practice of professional engineering by corporations without unduly jeopardizing the safety and life of the public. In fact such is the case today with a large majority of our State Registration Laws. I would urge a realistic approach and a careful consideration of the overall problem by those of our Member State Boards faced with any problem relative to changes in the registration law with respect to practice of engineering by corporations.

The second item, that of registration, without written examination requirements, of mature engineers with long established practice is a matter which I feel, in justice to the engineering profession and to the large number of engineers, who presently fall in that category, should receive earnest consideration by all boards to the end that some positive plan is put into effect. It is not necessary to review here the various reasons why an engineer who has been away from the classrooms for many years but has steadily and consistently engaged himself in various engineering endeavors, with progressive increase in responsibilities, should be worthy of entirely different consideration than that which must be accorded younger engineers. I regret that the term "by eminence" ever came into use for such registration since this does not properly define the type of individual which we have in mind. The mere use of the word "eminence" has perhaps prejudiced some of us against the application of this means of recognizing satisfactory experience and professional attributes in those who need or desire to become legally identified with the engineering profession, but who would give no thought whatever to attempting the same general written examination as required of younger applicants.

One of the principal difficulties with this type of registration procedure, seems to stem from the fact that there is a wide divergence of opinion as to the minimum age and minimum number of years of progressive engineering experience that an individual should have before being entitled to consideration for registration without examination. There is always a fairly close relationship between one's age and years of experience but it is not easy to agree on the minimum number of years of experience since we seem to have difficulty, at all times, in adopting a yardstick for comparing satisfactory and non-satisfactory experience. The fact remains that as long as we have in our registration laws, exemption from registration requirements for various types of engineering employment we will always have large numbers of engineers who have no need or particular desire for registration until they reach mature age. I therefore feel that it is the duty of the Member Boards of this Council to face this matter squarely and to adopt reasonable procedures for permitting recognition of this large segment of our national engineering population.

We continue to have the recurring question, followed by survey questionnaires, on whether or not the so-called "Model Law" should be revised as a whole or in part. Even with its faults I am sure that the Model Law, with the periodic revisions that have been made thereto, has served a useful purpose. Perhaps, now that we have registration laws embracing all of the area of the continental United States and three territories, we have no specific need for a Model Law; however, I see a decided need for the preparation of perhaps an entirely new type of treatise on this subject, one which instead of attempting to suggest the exact wording for registration laws would instead set forth in proper form all of the desirable provisions which should be incorporated in the law of each of our states with the principal object in view of bringing about greater uniformity in the coverage of all such laws. This could then be used as a guide by our Member State Boards for future amendments in existing laws.

For the conduct of such a study and the preparation of preliminary recommendations I believe that a relatively small group composed say of a special committee of the National Council and perhaps a special committee of the National Society of Professional Engineers—certainly the two

groups who are most interested in registration and the enforcement of registration laws—with these two special committees, in composition, representing various branches of engineering as well as various classifications of engineering employment, could best prepare the fundamental provisions of such a report and recommendations for preliminary approval by this Council. Later this would be submitted to the ECPD, ASEE, and all other technical and professional engineering societies for their approval or comments. Finally I believe there could be evolved a very useful tool which, having passed the acid test of this and other groups, could then be used effectively in bringing about the passage of amendments to many of our State Registration Laws. This might also strengthen our conception of our problem on more of a national basis. I hope that the incoming administration will give consideration to this suggestion.

The work of the above study group might give consideration to a provision which I feel must be accepted sooner or later if the Engineering Profession is ever to take its proper place as one of the great professions. This has to do with the mandatory requirement of higher education as a prerequisite to professional licensure. That the attainment of advanced or higher education is one of the major considerations for a successful professional career is generally acknowledged. If this is true then I believe that we have obtained sufficient age, as a profession, to now require that no person can qualify for registration as a Professional Engineer unless that person has been graduated from an accredited engineering curriculum. Changes in our registration laws in a matter such as this would have to establish the effective date at some reasonable number of years after the passage of the amendment. Formal higher education is available in a sufficient number of locations in our country and is obtainable, by one means or another, by any and all who sincerely desire to follow a professional career in engineering. With our state governments giving more and more thought to educational provisions and facilities I do not believe that as much difficulty would be encountered, in securing the passage of such a requirement, as some might suspect. Certainly the problem will not be any less difficult ten or twenty years from now than it is today. Such a provision would solve many of the most perplexing problems which are now faced by Registration Boards.

No report of this sort would be complete without paying tribute to the consistently fine work which is being done by our Headquarters Office in Columbia, S.C. I have had the pleasure of visiting these offices and familiarizing myself with its orderly and functional arrangement and the methods employed to insure prompt attention and handling of all of the routine and much of the special business of our Council. To our loyal and efficient Executive Secretary, Keith Legaré, and to his assistant, Miss Miriam Gibbons, I wish to express my thanks and warmest appreciation for their fine work and assistance to me. To Mrs. Beck I would also like to express my thanks for her continuing effort and fine work in reporting the business sessions of our Annual Meeting.

For the continuing interest, cooperation and financial support of the Founder Societies and other professional groups we are most appreciative. Such relationships should always be mutually beneficial.

To me has been accorded the very unique honor and privilege of having held the highest office in the two organizations which I feel hold the key to our continuing professional advancement. I refer to the National Council and to the National Society of Professional Engineers. I am convinced that closer liaison and active interest between our State Registration Boards and our State Professional Engineer Societies cannot be other than beneficial to our profession.

I am thoroughly convinced that this Council is an extremely worthwhile organization even though the accomplishment of our objectives seem to take unusually long at times and the final results at times may appear somewhat obscure. Nevertheless we are working and building to the

ultimate goal of making of the Engineering Profession an even greater influence in the daily lives of mankind while simultaneously making more effective the administration of the registration laws by which, and for which, our Member State Boards and this Council were created. (Applause.)

President's Report—1954
S. G. Palmer

It has been commented on by several of our presidents in past years that the National Council is made up of fifty two state boards, rather loosely knit together in that each board must operate under the registration law of its own state, and that the Council cannot impose rules or enforce the collection of funds. It can only operate successfully through the interest and desire of its members to cooperate. Part of the fine progress the Council has been making toward solving the problems of cooperation among boards is in a large measure due to the interim zone meetings to which I will refer again later in this report.

Personally your President feels like a comparative newcomer, having taken an active part in Council activities for only the past seven years while many of our members have given two and three or more times that period of service to the Council. As I read over the Proceedings of the annual meeting for the seven years mentioned, to refresh my memory, I cannot but have the greatest admiration and respect for the fine work and untiring energy exhibited by those men who have guided the Council not only during the years mentioned but in all of the other years since the Council was formed, and many of them are continuing to give of their knowledge, wisdom, and practical experience, to the end that the Council will continue to grow and expand its influence until every individual registered professional engineer will feel a personal interest in its aims and purposes and understands and appreciates what the work of the Council means to him and his profession.

One of the activities of the Council which is gaining favor and importance is the interim zone meeting. Last year President Stanford reported that for the first time interim meetings were held by all four zones. The four zones all held meetings again this year and all were well attended. I was privileged to be able to attend the meeting of the Northeast Zone in New York City, on April 3 and the Western Zone meeting in Reno, Nevada on April 10. Other business prevented me from attending the meetings of the Central and Southern Zones, much to my regret. Our Executive Secretary, Keith Legaré, attended the meeting of the Southern Zone in New Orleans on March 19 and the Northeast Zone meeting in New York. The meeting of the Central Zone was held in Topeka, Kansas, on May 7 and 8. At the meeting of the Western Zone the majority of the boards were represented for the first time at an interim zone meeting. Ten of the thirteen boards in this zone were represented by nineteen official delegates. The interim zone meetings offer an opportunity for many board members to attend who are unable to attend the Annual Council meeting, and they also provide meetings of smaller groups with the opportunity for more informal discussions than are possible at the larger Council meetings. I consider the interim zone meetings one of the most important activities of the Council, and I recommend that we continue to promote and support them. A year ago President Stanford called attention to an item of $400.00 in the 1954 budget to allow each zone $100.00 for necessary expenses of the zone meeting. The same amount is again provided in the budget for 1955.

Invitations were received by your President to attend the meeting of the Dominion Council of Professional Engineers in Toronto on May 26–28, and the meeting of the National Society of

Professional Engineers in Milwaukee on June 10–12. Being unable to arrange to attend either of these meetings, I requested Vice President John Gore to represent us at the Toronto meeting and Past President A. G. Stanford to represent us at the Milwaukee meeting. I wish to thank Vice President Gore and Past President Stanford for representing us at these meetings.

The original copy of the report on the examination of accounts of the Council for the period Jan. 1, 1953, through June 30, 1954, made by A. C. Clarkson & Company, certified public accountants, and addressed to your President has been received. The finances of the Council are found to be in excellent condition, and the reserve fund is reported in the amount of $20,353.24, which includes interest earned for the year ending June 30, 1954, of $643.87. The fund is now on deposit with the Home Federal Savings and Loan Association of Columbia, South Carolina.

Further with regard to finances should be mentioned a matter which has come up from time to time and which may not be entirely understood by all of our Council members. Several years ago some states objected to some of the activities of the Council, saying that state funds could not legally be used for such purposes. The Council receives $2400.00 annually from six national and two state engineering societies. As this money is not received from any state fund, it can be used for paying expenses such as clerical services, printing and postage, and for rendering any service to the members of the various engineering societies and to the general public. None of the funds paid by the state boards as membership fees are used for the bureau of information conducted by the National Council, and therefore there should be no criticism of expenditures for such activities. Special mention might be made of the contributions of the national and state engineering societies. In 1937 and again in 1938 the ASCE contributed $1000.00 and since that time has contributed $500.00 annually. The NSPE started in 1940 with a contribution of $100.00 and now gives $500.00 annually. The AIEE and ASME each contribute $500.00 annually. The Institute of Ceramic Engineers, the American Society of Agricultural Engineers, the New York State Society of Professional Engineers, and the Texas Society of Professional Engineers all make annual contributions to the Council. Contributions in past years have been received from state engineering societies of Connecticut, Maryland, and New Jersey. The Council is certainly indebted to all these societies.

Your committees have again performed an outstanding service to the Council as the fine reports to be presented at this meeting will show. I wish to commend the work of the Committee on Uniform Laws and Procedures, and the chairman of the committee, Mr. Robert Rhinehart. The presentation of the Suggested Standards should materially aid those state boards, which like my own, have under consideration at the present time amendments to the law. I wish also to call attention to the work of two other committees: the Committee on Written Examinations—Mr. William Spann, Chairman, and the Committee on Engineers-in-Training—Professor H. L. Solberg, Chairman.

I would like at this time to refer to recommendations which our Executive Secretary has presented to the Board of Directors concerning the standing committees of the Council. As the activities of the Council grow, it is natural that new committees are needed for various studies while other committees will have served their purpose and might well be discontinued to simplify as much as possible the work of the Council. With this in mind our Executive Secretary presented a recommendation to the Board of Directors in which he suggested that they approve the appointment by the incoming President of a Special Committee to study the functions of all standing committees of the National Council and submit a report at the 1955 annual meeting, regarding the following

items: (a) Which committees should be discontinued? (b) Which committees should be combined for more effectiveness? (c) What functions of the committees can be improved? (d) What amendments to Article III of the By-Laws should be adopted to accomplish the above? Further suggestions are included in the recommendation with regard to size and personnel of the committee. This recommendation was approved.

I wish to call to your attention also the recommendations of the Mississippi Board which are to be found on page 57 of the copy of Reports for the thirty third Annual Meeting and on page 5 of the June *Registration Bulletin*. The recommendations concern (1) presentations of committee reports, (2) copyrighting Council Proceedings, (3) nominations for officers, (4) expenditure of reserve fund, (5) certificates of service, and (6) commissions of office for elective officers of the Council. These were referred to the Special Committee mentioned above.

In conclusion, I wish to thank the members of the Board of Directors, the Executive Secretary, Keith Legaré, and the members of the various committees for the fine support given me during my term as President. I wish to thank the Council members for placing their trust and confidence in me in asking me to serve as their President during the past year, and I hope that in return I may continue to give my best efforts for many years toward the progress and welfare of the National Council in whose aims and purposes I have come to so fully believe.

President's Report—1955
John W. Gore

This, the Thirty-fourth Annual Meeting of the National Council marks another milestone in the continued forward progress of the Council, notwithstanding its unique relationship with its member bodies as compared with other National Engineering Societies.

A review of the proceedings of previous years will reveal that this forward progress is measured by the results obtained from the discussion of mutual problems of the member bodies of the Council.

This is accomplished at the Annual Meetings, as well as the various Zone Meetings. It has been noted that the activity at the Zone Meeting level has increased in the past few years. This acceleration is no doubt due to the increased interest and enthusiasm generated by the acceptance of greater work loads, in setting up Zone Committees to study particular subjects as well as by participating in discussions on preliminary Committee reports of some of the main Committees.

The subject for discussion and analysis may be a simple one of formulating a uniform procedure, in some phases of routine work, applying to all Member Boards, or may be one of attempting to reconcile any one of the many differences in the various state laws regarding requirements for registration.

This work has been carried forth by the various committees, working throughout the year, who then submit their report to the Council at the Annual Meeting.

We wish at this time to call your attention to the valuable contributions of the many Committees through the years, which have contributed to a much clearer understanding of the problems involved. You will find that the Committee reports to be presented at this meeting will contribute further valuable information for the consideration of all Member Boards.

I wish at this time to extend my thanks and also the appreciation of the Council to the Committee members and Chairmen for the time and effort required to prepare the excellent reports listed to be submitted at this meeting. This work cannot be underestimated, as it forms the backbone of the Council deliberations.

It is our opinion that a review and analysis of the many reports that have been submitted to the Council by the various Committees in the past, as well as those to be presented at this Meeting, will reveal that considerable time and effort has been expended by many Council members in an endeavor to attain the objective of the Council, viz: "Improving Professional Engineering Standards, . . . by facilitating Interstate Registration of Engineers . . . maintaining National Qualifications for Registration."

It is our belief that a full realization of the inestimable value of a comprehensive presentation of a Committee Report on one of the many phases of the Council work should provide an incentive for Council members, if so requested to participate in this important work. It has long been realized by many that one of the most satisfying rewards to be realized in life is the knowledge that you have been able to accomplish a deed or perform a service that will prove beneficial to one or many.

The requirement for many of the Committees and the value of their contributions to the Council and Member Boards could be fully realized by all members of the Council if they could serve as a Secretary of a Board for a period of years, as your President has, and be faced with the many problems presented in processing applications for presentation to the Board.

In many cases this may only require a request to the applicant to augment his original submittal of evidence with additional information, in order that the Board may be able upon a review of the applicant's file to make a proper determination in the case.

In many other cases, involving registration by endorsement, it becomes necessary to evaluate the basis of registration in the prior State, or listed engagements and experience as indicated by a National Bureau Certificate in order to determine if the applicant has met the requirements of our State Law.

The outline as given may appear to be easily accomplished, however, in many cases the complexities that arise require an extensive study and/or analysis of the applicant's file, which may in some instances involve a review of curricula in the so called "fringe" category, in order to determine the extent of credits in basic engineering acquired by the applicant.

In the fulfillment of the primary obligation of the State Boards, viz: determination of the competency of an applicant and registration if qualified; it has become apparent that due to a clearer understanding by all Member Boards of the problems involved in Interstate Registration, as a result of the benefit gained from the many reports by the various Committees on "Uniform Laws and Procedures," "Qualifications for Registration," and "Registration by Endorsement," the volume of detail work involved in the interchange of required information has been greatly reduced.

The full realization of the many problems has proven to be an active stimulus for the Committees to strive for a full analysis of their assignment in order to prepare a comprehensive presentation for consideration of the Council.

One of the great contributions toward a clearer recognition of one of the oldest, and as yet, not completely solved problem of the Council, and Member Boards, is the presentation of the tabulated report of the R. J. Rhinehart Committee, on Uniform Laws and Procedures, listing pertinent data, requirements, etc. of all state laws in a form that permits this information to be readily available, when needed, also that from the data submitted, the variance between the various state laws can be quickly determined.

This report may well be the basis of serious consideration being given by many States, in an endeavor to amend their laws, to be in conformity with a uniform recommended standard. We wish to call your attention to the section on "Amendments to Registration Laws" on page 22 of the

Annual Report of the Executive Secretary in your booklet of Reports for the Thirty-fourth Annual Meeting, for amendments to many State Laws during the past year.

It is of course immediately recognized that, upon the realization of uniform laws for all States, the basic difficulties now existing in the matter of interstate registration will be eliminated.

We wish at this time to especially call attention to the exceptionally fine work accomplished by Professor Solberg and his Committee as indicated by the Annual Reports submitted by his Committee for each of the last five years, on one of the important phases of our activity; viz: Engineers-in-Training.

Attention should be called to the valuable pioneering work accomplished by the EIT Uniform Examination Committee, under the Chairmanship of R. C. Gorham, as a Northeast Zone Committee.

This Committee prepared a set of Examination Questions, with answers, that were accepted and used simultaneously by eight State Boards in the Northeast Zone this year.

This concerted action measures to a great degree the valuable contribution of Committee activities to the Council.

The work of the Council is definitely one of cooperation, each Board working with other Member Boards with a full realization of the basic differences in Laws, viewpoints, local legal decisions, etc. toward the end that the purpose of the Council as spelled out in Article II, Section I of the Constitution of the Council is fulfilled.

It has been my privilege to represent the National Council at the Annual Meetings of several Engineering groups during the past year: The American Institute of Consulting Engineers in New York City; The Engineers' Council for Professional Development in Cincinnati, Ohio; The American Society of Mechanical Engineers in New York City; and The Dominion Council of Professional Engineers at St. Johns, Newfoundland.

At these meetings we found considerable interest in the Council activities, particularly at the meeting of The Dominion Council of Professional Engineers at St. Johns, where we found many of the subjects discussed at their meeting were also to be found on the agenda for our Council Meeting.

We have received a Certified Report on Examination of Accounts from A. C. Clarkson & Co., an independent auditing firm, of Columbia, South Carolina, covering audit of the Council's financial transactions from Jan. 1, 1954 to June 30, 1955. This report is included in the overall report of the Executive Secretary.

I visited the Council Headquarters Office in Columbia in March and found a well planned and efficiently operated office, prepared to meet any requirements of the many activities of the National Council.

This office headed by Keith Legaré, with his background of thirty-two years of experience as Secretary to the National Council has contributed to the efficient handling of all matters coming before the Headquarters Office.

At this time I wish to thank the Board of Directors, and Keith Legaré, for their counsel and guidance, which has been of great assistance to me throughout the year. Again I wish to thank the Committees and their Chairmen for their valuable contribution to this Meeting.

In closing I wish to state, that I hope that the deliberations of this Meeting will result in a firm forward step toward the overall objective of the Council, and the Council members will face the new year with renewed vigor to serve toward this end.

President's Report—1956
Bruce Williams

1. **Fellow Engineers and Guests:** Your President's Report for the Thirty-fifth Annual Meeting of the National Council of State Boards of Engineering Examiners may be characterized by a quotation from Alice's Adventure in Wonderland:

> "The time has come," the Walrus said,
> "To talk of many things:
> Of shoes—and ships—and sealing wax—
> Of cabbages—and kings—"

"The many things" include a survey of what the Council has accomplished this year; a discussion of objectives that, after a careful study of the issues involved, seem feasible and desirable for the progress of our National Council and its effects on the Engineering profession; some suggestions for changes in the Constitution and By-Laws, as well as the methods of policy and procedure, in order to facilitate and render more effective the work of the Council in carrying out its high aims and purposes.

Many points presented may be, and in fact are, controversial. They have their pros and cons. If enough interest is aroused to secure the appointment of a committee to study and report on some of these, good should result.

This is the first and the only opportunity that I, as President, have had or will have to cover and get into print the presentation of some subjects which I have spent considerable time in studying, and which, I believe, are vital to a healthy National Council.

2. **Acknowledgements.** Before I start on my official report I should like to make some acknowledgements of appreciation.

California, noted for its salubrious climate and magnificent scenery, can match these assets with another fine characteristic—the gracious hospitality and cooperation of its people, especially in conventions. It is with great pleasure that I express for the Council and myself to our hosts, the California State Board of Registration for Professional Engineers, our appreciation of their valuable services in planning for this meeting, and of the delightful time we are having because of their thoughtful courtesy. We are greatly indebted to the following persons and committees: To Harold Clark, General Chairman of the California Committee on Arrangements for this meeting, for his splendid work in planning the local program; to Helen Clark, for the delightful arrangements for the ladies; to the Entertainment Committee, headed by William T. Wright, which deserves much commendation for the fine entertainment we are having. Moreover, I wish to thank the chairmen and all other members of the various committees, who have worked, and are working, hard during this Convention, that it may be a success in furthering the purposes of the Council, and always a joy to remember.

Whatever has been achieved this year under my leadership has been accomplished primarily by the people with whom I have worked, have communicated by letters or telephone; and whose suggestions and advice have been of inestimable value.

First and foremost, I wish to express my sincere appreciation for all that our Executive Secretary, Keith Legaré, has done to help me this past year. He and I have differed this year, and in past years, on some points of policy, but I have learned, as my predecessors have, to respect his judgment and his thorough knowledge of matters affecting registration. He is one of the most efficient secretaries

that I have ever known in any organization. The Council has been not only his vocation but also his avocation during the many years that he has served it. Unless one has had an opportunity to work closely with him, as I have had this year, a true appreciation of what he has meant to the Council in handling of its diverse and often controversial matters, cannot be realized. I think that it is unnecessary to expand on his many duties—most of you are already familiar with them. May I also include the members of his staff, Miriam Gibbons and Nancy Mitchell; also Mrs. Beck, who does such an excellent job in reporting our proceedings. And if Mrs. Legaré has had to put up with as much from her husband as my wife has had to put up with me, I want to express to her my sympathy. Seriously, however, I know that she has been of great help to her husband, as Viola has been to me.

I wish to express my grateful appreciation to the Board of Directors, for their attendance at the different meetings; for their prompt answers to my letters; and for the counsel and guidance in handling the matters of the Board of the Council.

I thank also, the staffs of the different Member Boards and for their splendid cooperation and the prompt answers they have given me when I have written them directly for information.

I must pay my respect and tribute to the Past Presidents of the Council and acknowledge the fine inspiration and support that I have received from them and from other men who have worked many years for the Council.

I will never forget the assistance and encouragement that I have received from the members of the Missouri Board—Walter Bryan, Bill Spann, and Frank Beard of the Engineering Division and—Hari Van Hoefen, Paul Buchmueller and Everett Johns of the Architectural Division and from our efficient Secretary, Mrs. Clemmie V. Wall, and her very capable staff. Especially do I want to express gratitude to Senator A. L. McCawley, the one to whom I owe the most and one of the very outstanding leaders in his knowledge of engineering registration.

Representing the Council, I want to thank the Founder Societies and those other associations that have been in the past, and are now, sending their representatives to our meetings; and for their financial assistance in the purchasing of supplies, bulletins, etc.

Finally, I must express my pleasure and appreciation for the honor and privilege I have had of serving you as president, especially because of the wider acquaintanceship, greater fellowship, the rewarding knowledge and gratifying help and cooperation that I have received from those with whom I have had the pleasure of working and serving.

On my part as President I have given my best efforts to carry out the high ideals and lofty aims of the National Council and for the advancement of the engineering profession; and have pledged to continue in future years my unswerving loyalty and devoted service to the National Council which has meant so much in my life.

3. **Distinguished Service Certificates.** In 1954, the Mississippi Board made certain recommendations to the National Council. A special committee, with C. S. Crouse as chairman, was appointed to study these recommendations and also a number of other important matters.

That committee made the following report on the subject of Distinguished Service Certificates, and appears on Page 48 of the 1955 Proceedings: "We recommend that the situation be left as it is," (which is the awarding of the Distinguished Service Certificate after twenty years of service) "with the strong suggestion that the Distinguished Service Certificate be given on the basis of service to the Council, and not primarily on the basis of the time served on a State Board."

A special committee was appointed this year by the President to make recommendations as to whom the Distinguished Service Certificates should be awarded. Their recommendations were then

adopted by the Board of Directors. A little later in the program, we will hear from our Secretary, who will explain further regarding the Distinguished Service Certificate.

The presentation of those awards will be made at that time.

4. **President-Elect.** I think one of the greatest changes for advancement in the work of the Council has been the change in the By-Laws made last year, providing for a President-Elect instead of a Vice President; and I trust that the Constitution and By-Laws Committee will have a recommendation changing Section 2, Article II of the By-Laws, which now reads, "The President _____, shall appoint all standing committees subject to the approval of the Board of Directors _____," by eliminating "subject to the approval of the Board of Directors."

In other words, the President-Elect should be able officially to appoint all standing committees without waiting for the Board of Directors to meet and having them approve those appointments. If other changes in the By-Laws have to be made to accomplish this, the Constitution and By-Laws Committee should do so.

The President-Elect should have the opportunity to appear at the Annual Meeting of the Council, before it closes, and to present his program for the year that he is to be President. Having the opportunity to appoint the chairmen and members of the committees and to present his program to the Council and to those chairmen and members, ahead of his induction into the office of President, should contribute much to the growth of all the functions possible to be done by the Council.

Notification months ahead, to the chairmen and all members of all committees concerning the Annual Meeting at which the President-Elect will be installed as President, gives those chairmen and members a much better opportunity, if they can do so, to plan to be in attendance at the meetings of their committees on which they will serve for the next year; to learn what the President will outline as his plans of procedure for the work of each committee; and to ask the President specific questions.

5. **Interstate Registration.** One of the primary purposes for which the Council was organized, and its justification for continued existence, is the providing of procedures which will facilitate interstate registration with as little effort on the part of registered engineers as is consistent with the observance of our varying laws and the necessity for care in the registration of engineers in our several states. I believe the word "reciprocity," as so often used is a misnomer, since it implies that Board A will do for the registrants of Board B no more than Board B will do for the registrants of Board A. Actually, as a matter of law, an engineer simply has to fulfill the requirements of the law of the state in which he seeks registration, regardless of his registration elsewhere. In Missouri we prefer to proceed under what we call the rule of "comity," which means that we will give full faith and credit to the official acts of other Boards, as required by the Constitution of the United States. Putting it in another way, we have complete confidence in the capability and conscientiousness of our fellow Council members.

It is definitely known and should be understood that there never will be one hundred percent uniformity in all state laws.

That is the reason why there are so many questionnaires and so many letters to be answered, so many records to be reviewed, and so much information to be passed on; yet that is a part of one's duty as a member of a Registration Board, and to see that this information is given promptly.

Yet, this is good business for better relations, and will pay big dividends to yourself in the knowledge that you have done your best in the best way.

6. **Corporate Practice of Engineering.** The extension of corporate activity into engineering presents a serious, but not an insolvable, problem to all registration boards, to the corporations themselves, to engineers everywhere, and to the general public.

The word "practice" as indicating engineering service by a corporation, is conflicting and confusing, since a corporation cannot supply the indispensable personal element that distinguishes professional judgment from corporate action.

The words "registered" and "registration," when used as authorizing corporate activities in engineering, also are in conflict with other and older provisions of the registration laws, since a corporation cannot acquire an engineering education, pass an engineering examination or possess any of the qualifications for engineering registration required of a natural person.

The first step toward solving the problem presented by corporate activity in engineering, inaccurately designated as "corporate" practice of engineering, is, unanimous agreement on terminology, (1) that would clearly distinguish between engineering practice by licensed professional engineers, and rendering engineering services by a corporation through the agency of registered professional engineers; and (2) that makes a distinction between the "registration" of natural persons as professional engineers, and the issuing of a certificate of authority to a corporation to engage, use, and offer professional engineering services to the public.

Proceeding from such a point of departure, the solution of the so-called problem of corporate practice of engineering is not too far away.

An excellent article on this subject appears in the May, 1956 issue of the magazine, C*onsulting Engineer*. It was written by Senator A. L. McCawley.

This is a subject that is on the agenda tomorrow afternoon during the panel discussion.

7. **Legislation.** One of the objectives of the Committee on Uniform Laws and Procedures is working toward an ideal Registration Law, and toward the acceptance by every state of the Certificate of Registration from every other state, provided, of course, that the registrant meets the requirements in the law of those other states.

This work requires eternal vigilance by every engineer interested in the protection of the public health and welfare, and in the growth and recognition of the engineering profession.

This objective can be eventually established and can be made more effective only through changes in our present state laws; and by the adoption of regulations by registration boards within the scope of existing registration law, so that such regulations will in time, have the same force and effect as legislative enactments.

There have been certain meetings in the National Council; and, in all meetings, there have been many times, when, outside of the regular routine and reports of the President, Secretary, and Committee Chairmen, the remainder of the time has principally been taken up by the asking and answering of questions covering the same ground that has already been covered many times before.

The answer often given to many of those questions is, "That it is impossible to do that in my state, because the state law is different." Perhaps, it would be impossible to tabulate such questions and answers; but, the answer that would be satisfactory to most of the inquirers might be obtained by their studying the report of the Committee on Uniform Laws and Procedures—a study which was stressed and pushed toward some definite conclusions by Robert Rhinehart and his committee the last two years, and which is embodied in a summary of the recommendations of that committee. This study is being continued this year by the committee headed by William M. Spann.

In other words, the Council has, by a majority of votes, considered that certain procedures are acceptable to most states, even acceptable to those states which have laws that do not permit such definite action now, but would be permissible if they adopted suitable regulations. This indicates the tendency toward trying to reach an agreement, whereby it will be easier for all states actually to accept the accreditation for the registration of a Professional Engineer from another state.

Members of State Boards should work with the State Engineering Society's Committee on Legislation, when the proper ground work has been laid, when that committee presents to the Legislature changes that will strengthen the state registration law and make it more in line with provisions which will be acceptable to all State Boards.

8. **Committees of the National Council.** The By-Laws on Committees do not state in each and every case specifically the number of members that shall be appointed to those committees.

One By-Law says "the committee shall have at least one member from each Zone." There is no uniformity; and there does not necessarily have to be any uniformity in the numbers on committees or on the question whether there shall be one member from each Zone or from each Board.

Section 7, Article III, of the By-Laws, Committee on Engineers' Council for Professional Development states: "The Committee shall consist of three members, one appointed each year for a term of three years _____."

This Committee on Engineers' Council for Professional Development functions much better, is more proficient, and accomplishes much more in its work by being so organized, because each member is appointed for a term of three years.

It might be worth while to study the advisability of having a similar clause for certain other committees, whereby at least three members should be appointed, one each year for a term of three years. Then, as many additional members may be appointed as is advisable or desirable.

Last year, I appointed at least two members from every Board to serve on some one of the Committees of the National Council, unless specifically limited in the By-Laws.

9. **Engineers-in-Training.** The Engineer-in-Training movement really got under way in the late forties. It is now embodied in nearly 80 percent of the Registration Laws of the Nation. This movement is increasing in popularity and may reasonably be expected to become the gateway through which young Engineers will later enter the profession as Registered Professional Engineers.

The work this year of the Committee on Engineers-in-Training is headed by Director L. E. McCartt, from Kentucky, who has done a very fine job with this Committee in following the directives in the By-Laws and is somewhat different from what has been done in the past.

Let me quote from Section 6, Article III, of the By-Laws, Engineers-in-Training: "This Committee shall consist of not less than seven members. The Committee on Engineers-in-Training shall promote amendments to Registration Laws and adoption of administrative procedures providing for the Engineer-in-Training program, and shall assist in its development."

By agreement of several other Committees, the Engineers-in-Training Committee, headed for several years by Harry Solberg, has done much commendable work on examinations.

This examination work is now being handled by a sub-committee of the Committee on Qualifications for Registration headed by Dean Steinberg of Maryland. Therefore, Director L. E. McCartt and his committee have had a new approach to their work. Their report will indicate what has been done this year, and they have made an excellent start.

I believe the time is coming when all registrants will have been, at one time, enrolled as Engineers-in-Training, and perhaps these enrollees will have to be graduates of an accredited

Engineering School. Registration laws in some states require graduation from an accredited course in medicine and law before doctors and attorneys can be licensed.

I believe also that the time is coming when all professors who teach engineering courses will themselves be Registered Professional Engineers. I understand that there are come colleges where this is now true. Thus, the student, the Engineer-in-Training to be, will have a better understanding of Engineering as a Profession.

10. **Finances.** Section 8, Article III, of the By-Laws, reads as follows: Committee on Finances. "This Committee on Finances shall study the financial needs of the Council, recommend sources of income, and ways and means of securing adequate funds for the proper operation of the Council and assist the Board of Directors in all financial problems."

The Finance Committee has some particular problems, such as setting up a Reserve Fund to cover the retirement plan for certain officers. If additional moneys are required, let the Committee present a plan for securing this money.

The receipts from the National Bureau of Engineering Registration as shown in the budget is not net income, but gross income, subject to almost equal deductions under appropriations, but only specially mentioned as parts of Items 9 and 11 of the proposed budget. The cost to the Council of the work necessary in performing the functions of the National Bureau of Engineering Registration is approximately the same as shown under Item 2 of estimated income.

In other words, the National Bureau of Engineering Registration is self-supporting, but it does not contribute above its costs any large sum to the net income of the National Council.

11. **Sustaining Members.** Section 4, Article III, of the Constitution states: "A Sustaining Member shall be a state or national society, institute, association or organization of professional engineers that contributes to the financial support of the Council."

Article III, of the Constitution, states:

Section 6—"A Representative shall be a member of a sustaining member designated to represent it at an Annual Meeting."

Section 4, Article I of the By-Laws, states: "_____ Sustaining Members and their representatives shall not be entitled in vote."

According to my understanding these sections, Sustaining Members have a right to the floor at any meeting.

In the past, it has been almost necessary, to depend partially upon the contributions made by The Engineering Founder Societies; in fact, we do owe them much, and we express our appreciation for that help, without which we would not be where we are today. However, the time should soon come, if it is not here now, when we do not need that financial help in the same manner in which it was given. There is, of course, a difference of opinion among members of the Council on the question of accepting financial support from private sources, such as engineering societies.

It is my position that members of Founders' Societies and of the other engineering organizations who have been making direct contributions to the support of the National Council are and should be welcome guests, and should have the privilege of addressing the Council. I am most certain that the Council has derived and in the future will receive great benefit from suggestions presented in such manner. The National Council of State Boards of Engineering Examiners is composed of public officials, appointed to administer laws that are enacted under the police power of the several states and territories for the protection of the general public and the peace, health, and safety of the inhabitants of the state. This Council

can live, and should live, on its own resources, derived from membership dues and from services of ever-increasing value.

The Council should carry on its activities without contributions from any source, without compromising or sacrificing the sovereignty of the states it represents.

Any time during this year that our Secretary has received moneys from these Engineering Societies, it has been received in payment for services and information rendered those Societies by the National Council, and not as contributions.

12. **Interim Zone Meetings.** My first recollection of the birth of the Interim Zone Meeting was a meeting called in 1946 by A. W. Archer, an architect, first chairman of Missouri's Joint Board, when he invited all members of the Boards of those states contiguous to Missouri to a meeting in St. Louis. C. S. Crouse was Director from the Central Zone at that time and attended the meeting, as did N. W. Dougherty of Tennessee. Board Members from both Architectural and Engineering Boards were invited, and twenty-three attended. This resulted in the members getting better acquainted with each other and discussing informally the possibility and advisability of holding such meetings in the future.

Central Zone Interim Meetings have been held annually since then.

Al Jones, of New Jersey, told me the first Interim Zone Meeting in the Northeast Zone was held in 1949, and since then these meetings have been held annually. This action regarding Interim Zone Meetings was followed by the Southern Zone, and then by the Western Zone. The growth in the value of these meetings, as measured by the importance of the subjects discussed and the number in attendance, has been remarkable. Virtually every subject that has come up for action before the National Council has been previously studied and discussed at these Zone Meetings.

Section 12, Article III, of the By-Laws, reads in part as follows: Committee of Nominations. "The Committee shall receive recommendations from the Zones and submit nominations at the Annual Meeting for a slate of officers for the next administrative year, _____."

Note particularly that each Zone now makes a recommendation to the Committee on Nominations as to the person desired for Director from that Zone; and every fourth year that Zone makes a recommendation as to the President-Elect.

How important it is that this procedure, a vital matter in the growth and management of the Council, comes from the grass roots instead of from the top down.

At times recommendations from certain Zones have resulted in the appointment of special committees of the Council to study the recommendations from that Zone. At the Zone Meetings, time is available for each member to present his views. This is not always possible at the Annual Meeting.

I predict the continued growth of the Zone Meetings in attendance and the importance of matters considered.

13. **Participation by Individual Members of Member Registration Boards in Other Engineering Activities.** While each individual member of a State Board is a state official, and as such, should not place himself in a position of being obligated to any person, organization or group, nevertheless, he should not hold himself aloof and refrain from doing his part in Engineering Societies. I feel it is important that he belong to his State Engineering Society, to some national engineering group, and that he participate in their activities, not in conflict with, but in furtherance of, his duties as an officer of the state.

I think it is well at times for State Boards to meet with the officers of the State Engineering Society and to invite such officers to their meetings. Board meetings, of course, are open meetings, except in certain cases where the Board goes into executive session.

14. **The Future.** The June 1956 issue of *Nation's Business* states that the number of youths going to college will be 15,000,000 in 1956; 20,000,000 in 1965; and 28,000,000 in 1975.

In a report dated June, 1956, by *The Missouri Public Expenditure Survey*, it is stated that studies covering the years 1900 to 1955 indicate that by 1970 there will be an increase of 81 percent in students in colleges over the 1955 enrollment. *Chemical Week* of July 14, says there will be a 100 percent increase.

Gentlemen, we are Engineers looking forward to 1975, when there will be 28,000,000 youths in college, and many of them will be studying engineering.

We must plan for the future. We must plan not only for the problems confronting us at this immediate time, but also for those arising when none of us will be here. There must be a solid foundation on which to build for those who follow us.

It is well for some to point out the problems and for us to listen. But it is better for us as a group to solve these problems.

15. **Direct Quotes from Past Presidents.** I wish to supplement my remarks by direct quotations from the reports of some past presidents.

One past president reported,

> Your national officers have no inherent or other powers to do anything but suggest. They cannot impose rules and regulations nor can they enforce the collection of funds to operate the Council. In short, this organization, if it operates at all, must function through a mutual understanding of our common problems, through a considerate appraisal on the part of all Boards of any problem peculiar to an individual Board, and through the fullest desire to cooperate on the part of everyone." "I am frank to say that in some of the earlier National Meetings that I attended it was very difficult to see any progression because of long and often acrimonious debate on matters that seemed quite trivial. That there has been advancement during the years is now apparent because I know that the attitudes of the Board members now is greatly different from what they generally were then. There is a much greater appreciation of individual problems and what is probably even more important not only a willingness but a desire to understand the other fellow's problem and to try and compose any differences that may develop, in a spirit of give and take.

Another President said,

> There seems to be a continuing feeling, on the part of some of our Member State Boards, that a change in the name of our "National Bureau of Engineering Registration" might be both appropriate and would contribute towards a wider acceptance of the services of this Bureau by some of the States which do not now recognize National Bureau certification. One of the arguments advanced against the present name is that the certifying procedure of the National Bureau is not actually on a national scale. Perhaps a similar objection could have been raised for many years on the name of our National Council itself, since it is only in the past few years that we have been accepted and recognized by all States and Territories. Others feel that the word "certification" is more appropriate in the Bureau's name. I have no specific suggestions to make in this matter other than that it be explored objectively from the

> standpoint that anything that will make our National Bureau of Engineering Registration a more effective and acceptable medium for the simplification of interstate registration would unquestionably be desirable.
>
> We continue to have the recurring question, followed by survey questionnaires, on whether or not the so-called "Model Law" should be revised as a whole or in part. Even with its faults I am sure that the Model Law, with the periodic revisions that have been made thereto, has served a useful purpose. Perhaps, now that we have registration laws embracing all of the area of the continental United States and three territories, we have no specific need for a Model Law. However, I see a decided need for the preparation of perhaps an entirely new type of treatise on this subject, one which instead of attempting to suggest the exact wording for registration laws, would instead set forth in the proper form all of the desirable provisions which should be incorporated in the law of each of our states with the principal object in view of bringing about greater uniformity in the coverage of all such laws. This could then be used as a guide by our Member State Boards for future amendments in existing laws.

One of our Presidents reported,

> …we must continue to work for the improvement in procedures in various states to facilitate interstate practice of qualified professional engineers. To this end, engineers in states which at present have low standards should work to bring local requirements at least to the requirements of the Model Law, and states which now have higher requirements, cannot with logic insist that qualified engineers be required to meet requirements that may be discriminating. Higher standards for registration are to be desired, but the various states must move together in this direction.

16. **In closing.** I should like to refer to other important matters, on which much might be said, but on which more study is needed. I shall present briefly several of these problems.

(1) Registration as a Professional Engineer, versus registrations in the field and branches of engineering.

(2) The policing of the registration law and the protection of the public against incompetent registered Professional Engineers, as well as, the practice of Professional Engineering by non-registered engineers. This last situation is handled in some states by proceeding through the County Prosecuting Attorney and in other states by the use of injunction proceedings.

(3) The restriction of public funds in payment for public structures to those planned by registered engineers.

(4) The practicing of engineering by a registered professional engineer in a state in which he is not registered.

I recommend that we study the plan, as now used by Ohio, of giving the full examination, in two days, at the time of graduation. Then the applicant, having passed this two-day examination, would be enrolled as an Engineer-in-Training. Final registration as a Professional Engineer would follow when the Engineer-in-Training has obtained the necessary number of years of engineering experience, as proved by the filing annually of a detailed report of this engineering experience, with all the states agreeing on this uniform information report. Each state would use its own method of checking the accuracy of this engineering report.

Also, I reiterate, in order not to lose the possible value of suggestions that have come from the presidents in the past, after they have completed their year's work and have met certain problems and studied the same, it is advisable that a motion should be made from the floor, at the proper time, that the President-Elect appoint a committee to make such studies, and formulate a report of recommendations as to what action, if any, should be taken.

We are not interested in these matters covered in this report from the standpoint as to how any one may vote for, or against the same. However, all of us (100 percent) are vitally interested in the questions, whether our standards are successfully maintained, and whether we are assured of good sound growth and advancement; in the benefit gained by the public, by the engineering students, by the Engineers-in-Training and the Registered Professional Engineers.

Let us therefore approach our problems and objectives with renewed enthusiasm and energy for the welfare and progress of our esteemed Council and the consummation of its purposes, in a spirit of tolerance and fairness, cooperation and a willingness to accept responsibility to carry on the splendid work of our stalwart leaders of the past in establishing and promoting their altruistic purposes of improving engineering standards in all the states to serve the best interests of the public and the profession.

To my successor, our new President, E. R. Stapley, I wish the best of luck and success in his engrossing, but richly rewarding, office. My personal wish for all of you, my friends, is expressed in the following lines of an Irish saying:

> "May the wind be at your back,
> May the road rise up to meet you,
> And may God always hold you in the
> palm of his hand!"

President's Report—1957
Edward R. Stapley

In presenting this annual report of the President of the National Council, I shall attempt to summarize briefly the Council activities during the year. Some of those covered in the report of our Executive Secretary will not be read at this time. Some comments and recommendations will be made.

Many of you know that this organization of ours, the National Council of State Boards of Engineering Examiners, is one of a peculiar nature. This has been pointed out by many former presidents in their reports. It possibly will bear reemphasizing at the beginning of this Thirty-Sixth Annual Meeting.

Gems of Wisdom from the Past

A Past President of the Council, Dean G. M. Butler of Arizona, summed this up well at an Annual Meeting several years ago when he said "this is not a legislative body, not an administrative body, and not a judicial body."—"It is nothing in essence but an informal gathering of people directly concerned with the administration of state and territorial registration laws, who meet together for the sole purpose of exchanging ideas and suggestions; of trying to gain from the experience of others ideas that will be useful to them in their own states." Dean Butler continued: "It is certainly a deliberative body in which we discuss things we think ought to be done, and from which we should take back ideas to our boards and try to induce them and the legislatures of our states to improve our registration laws and our administration of them."

In his annual report to the Council in 1953 President A. G. Stanford of Georgia made these statements, continuing and further emphasizing the thoughts of Dean Butler, I quote: "As all, except

perhaps some of the newer members of this Council know, this body has no power or authority to commit or bind any Member State Board to any action whatever as a result of our deliberations. We can only strive by means of cooperation, perseverance, the exchanging of ideas and the application of logic to the changing problems and requirements of those we serve, to bring about not only a willingness but, more important, a desire on the part of all of Member State Boards to individually seek always to improve registration procedures and to work actively to secure passage of amendments to Registration Laws, where necessary to bring all such laws into a more consistent pattern."

And let me pick one further sentence from this report of Past President Stanford. Again I quote: "I cannot bring myself to believe that the life, health or safety of persons residing in one state or section of our country is any more valuable or worthy of protection, than of those residing in any other state or section, nor do I believe that among professional engineering practitioners the per capita rate of dishonesty is potentially greater in one state than another."

Truly, gentlemen, these are "gems of wisdom."

One has but to attend a single Zone or Annual Meeting, or read the Proceedings of even one of these meetings to know that much good has been accomplished. The "Purpose" of the National Council, as set forth in Article II, Section 1, of the Constitution, is being achieved, possibly slowly but certainly surely.

This accomplishment and progress has been achieved through a great deal of time, labor and thought on the part of many devoted individuals. They merit our deep respect and admiration. We have honored officially many of them in the past. We shall honor others at the Banquet Friday evening.

The President-Elect

It happened to be the particular lot of the speaker to become your first President who had been selected first as President-Elect. The Constitution was even changed in this regard just prior to his taking office. I am sure that the advantages inherent in this change of the office from Vice-President to President-Elect will become more apparent as time passes.

Committees are the backbone of the National Council. The Council will move forward or stagnate largely according to the work of its committees. The President-Elect may now have more time in which to select his committee personnel. He is still faced with the problems of geographical distribution by Zones and of the representation of Boards; of some consideration of proportional representation for the Boards with the larger numbers of registrants; of sufficient change or rotation in committee membership to bring in new views, widen interest and insure progress. And last—and very important—he needs to obtain strong committee leadership and good member participation.

As President-Elect the speaker attempted—I say "attempted"—to do all of these things. To encourage more responsibility in the leadership of committees, vice-chairmen were designated. The worth of such changes is probably still to be weighed and fully evaluated. It is hoped that President-Elect Janssen has been successful in reaching good solutions to all of these problems in his committee selections.

It occurred to me that the President-Elect should have opportunity to actually participate in the business affairs of the Council more than as simply one member of the Board of Directors. At my request prior to this meeting President-Elect Janssen agreed to assist your President in presiding at these business sessions.

A Brief Resume of Council Developments in the Year

Late in his official year your President visited the National Council office in Columbia, South Carolina. (It is believed such a visit should be made by every Council President, preferably early in

his year of office.) There he obtained a better understanding of Council affairs and how Council work is handled. A great deal of business goes through the Council office. It is felt that Secretary Legaré and his staff handle it expeditiously and well. It would appear that the combination office and staff arrangement which has been worked out between the Council and the South Carolina Board operates to the advantage of both.

From the financial statement and auditor's report it would appear that the National Council is in good financial condition. Your Executive Secretary has a reputation for keeping expenditures well within budget appropriations.

The chairman of our Council Committee on Finances has worked hard and has submitted a very "meaty" report from his Committee on this very important subject. If you have not already read the printed report, it is hoped you will give it your strict attention and deep consideration when it is presented. There are many important points involved.

The future retirement of Secretary Legaré and possible readjustments in the operation of the National Council headquarters will pose problems of facilities, personnel and finances. It is hoped that the Special Committee on Plan for Future Operation of the Council, Chairmanned by Professor C. S. Crouse of Kentucky, which was appointed in November 1956, will have important recommendations to present at this meeting.

The Committee on Uniform Laws and Procedures and the Committee on Qualifications for Registration, along with some of the other Council committees, have stirred up a great deal of interest and discussion in their activities during the current year. The Panel Discussion Friday afternoon will develop some of the important topics to which these committees have given their attention. It is expected that some recommendations for Council action will result.

The Engineers-in-Training Committee has been moving forward with trials and evaluations of uniform examinations. The interest in these examinations has continued to increase in the four Zones.

The Council Committee on Public Relations, now just two years old, has been getting started on a program of suggestion and procedure which will be of value to the public which registered professional engineers serve. In general, I think we will all agree that as engineers we give too little consideration to the important subject of relations with the public.

It is hoped that the report of this Public Relations Committee will stimulate your thinking and action. It is particularly important that professional engineers look ahead of legislative thinking rather than follow behind. The State or Territorial Examining Board, along with the National Council, should be a **personal matter** with every registered professional engineer. At the Los Angeles meeting President Bruce Williams deplored the seeming lack of time devoted to State, Zone and Council affairs at the meetings of Examining Boards.

The three members of our Engineers' Council for Professional Development Committee should be particularly complimented for the fine representation they have given us. As you possibly know, one of these three, Russell G. Warner of Connecticut, has served as Vice-President, while James H. Sams has served on the Executive Committee of the ECPD organization during the past year.

The Committee on Land Surveying has presented the results of further study of this field and the qualifications for registration therein. The Committee has also presented a suggested outline for an examination for Land Surveyors.

The main project to which the Committee on State Board Secretaries has devoted its attention has been the assembling of "Zone Kits" containing copies of all forms used by the Boards and the circulation of these "Kits" to the Member Boards in the Zone.

An important accomplishment of the National Council during the year has been the preparation and printing of a "Digest Of Court Decisions Concerning The Registration Of Engineers And Surveyors." The compilation and publishing of such a Digest by the Executive Secretary was authorized at a meeting of the Board of Directors in Los Angeles last year. To assist Secretary Legaré in making the legal search necessary, Edgar L. Morris, an Attorney and Registered Professional Engineer of Columbia, South Carolina, was retained. This Digest, printed and punched for insertion in the black loose leaf binder with the Synopsis of State Engineering Registration Laws and Policies and Procedures of State Boards, was distributed to all Boards. There has been considerable demand also for such a digest from outside sources.

Correction sheets covering the changes, as of July 1957, in the Synopsis were also prepared. Member Boards should substitute these 1957 sheets for sheets bearing an earlier date.

The Zone Organization

Although the first meeting of Boards of an area or zone nature was seemingly held in 1946, it has been a matter of only four years that interim meetings have been held in all four Zones.

It has been the feeling of your President that, in a loosely knit organization such as this, contact and interchange between the National Council and the Zone organizations are particularly important and worthwhile. To this end during his term of office, your President attended the meetings in all four Zones. These meetings were as follows:

Northeast Zone in New York, New York, Saturday, April 6—a one day business meeting

Western Zone in Albuquerque, New Mexico, Friday, April 26—a one day business meeting

Southern Zone in Asheville, North Carolina, Friday p.m. plus Saturday a.m., May 10–11—a one day business meeting

Central Zone in Indianapolis, Indiana, Friday all day plus Saturday a.m., May 17–18—a one and one-half day business meeting

Attendance at these meetings served to further impress me with the value and importance of the Zone organizations as an intermediate meeting ground for the discussion of registration. Due to their nature, with fewer Boards represented, the delegates feel that more time is available and that there is more freedom for discussion of problems. This cannot be emphasized too strongly.

Although in only one Zone, the Central, was more than a single day allotted to business affairs, the Southern Zone spread its business sessions over a two day period and the Western Zone is considering the possibility of more than a one day meeting in the spring of 1958.

Although time is at a premium with all Board members, it is believed that lengthening all Zone business meetings to one and one-half, or even to two full days, will increase attendance, provide opportunity for a discussion of more problems, and prove advantageous to both the Member Boards and the National Council.

It is the personal feeling of your President that both the President and the Executive Secretary should attend the interim meetings in all four Zones if at all possible. The attendance of these Council officers at Zone meetings might be facilitated if the Zone Directors would work out together a schedule of dates and places which would reduce the time and expense involved to a minimum.

To increase mutual acquaintanceship and interchange of ideas your President suggested to the Zone Directors last spring that information concerning their meeting dates, places and programs be sent to all Boards outside of their areas with an invitation to visit the meeting. Engineers are great travelers. Board members from other Zones might find it convenient and interesting to look in on these sessions.

Committees, appointed by the Directors as primarily Zone Committees, or organized as sub-committees of Council standing committees, would broaden participation in Council affairs. The membership of Council committees might then be reduced to one, or at the most two members from each Zone plus a chairman and vice-chairman. It is the opinion of your President that a Zone Director has too little to do officially and as a natural result does too little. (This is no reflection of the present Zone Directors.) The importance of the work of the Zone organizations could well be increased. Something along this line has already been done in some Zones.

Relationships With Other Engineering Organizations

As official representative of the National Council and pursuant to action of the Board of Directors in Los Angeles, your President attended the Annual Meeting of the Dominion Council of Professional Engineers in Halifax, Nova Scotia, May 22, 23 and 24. This was a most interesting and enjoyable experience. We can learn a great deal from our professional engineering neighbors to the North. They are a fine group of men. Colonel J. M. Muir, Secretary-Treasurer of their organization—now the Canadian Council of Professional Engineers—was selected to be their official representative at this meeting. I hope that each of you will greet Colonel Muir.

It was also the privilege of your President to attend as official representative of the National Council the Annual Meeting of the National Society of Professional Engineers in Dallas, Texas, June 7 and 8.

Invitations to your President were received during the year from many of the national societies to be their official guest at meetings and banquets. These invitations were greatly appreciated and your President would have liked to have attended all of these affairs.

Having participated in the activities of the Oklahoma Society of Professional Engineers for many years before I had the privilege of being selected as a member of the Oklahoma State Board—and thus become a member of the National Council—I had plenty of opportunity to recognize the value of the state professional society. State Boards of Registration are particularly dependent on state professional engineering societies. There should be a particularly close relationship between these State Boards and the corresponding state professional engineering societies. This same relationship is likewise important between the National Council and the National Society of Professional Engineers.

Similar cooperative relationships should exist between the National Council and the Founder Societies, as well as with all of the many other technical societies.

The National Council is very appreciative of the support—financial and otherwise—which it has received from many of these societies. It is hoped that our Constitution and By-Laws Committee, and this Council at this Annual Meeting will agree on classifications and requirements for affiliate membership which will be completely satisfactory to all concerned.

In the United States everyone seems to be "organization minded." Almost any day now I fear we may hear of the American Society of Cotter Pin Engineers, or of a new national honorary society in engineering colleges of those students who can add correctly a column of five figure numbers without an adding machine. (I may be speaking more truly than I realize.)

The need for unity and a united front among engineers becomes greater with each passing day. Are we not possibly like the individual who mounted his horse and rode off in all directions, or like the confusion of tongues at the construction of the Tower of Babel in our understanding? As engineering leaders we have today a tremendous responsibility to increase understanding and promote cooperation among **all** engineers.

Acknowledgements

When the record of this year goes down in NCSBEE history, if any important progress has been made, if any great good has been accomplished, it will be due to the interest and labors of the chairmen, along with the vice-chairmen and members, of the Council committees. Your President wants to express his personal appreciation and thanks to all of the Council members who participated actively in the committee work, and particularly to the chairmen and vice-chairmen of those committees, many of whom did particularly yeomen service in the face of difficulties.

The advice and support received from the Past Presidents, the President-Elect, the Zone Directors, and various members of the National Council are also deeply appreciated.

Our experienced Executive Secretary has been most helpful to your President during his term. There could not be a more loyal, sincere and hard working official than our Executive Secretary, T. Keith Legaré. Like the one-time famed designer, Chick Sales, Keith will say "and I'll tell you why" after advising you on some question. To you, Secretary Legaré, and your highly efficient office staff, I express my thanks and best wishes.

Although this Annual Meeting is hardly under way we can already realize that Colonel Moses E. Cox, the General Chairman, Mrs. Cox for the Ladies, and the other members of the Arrangements Committee have all done a marvelous job here in Atlanta. It is hoped we shall all take occasion to tell them so.

To Conclude

Our Executive Secretary's printed report shows that as of June 1957 the total number of registrants reported by the various Boards was 238,504. Deducting for duplication of figures due to engineers registered in several states, Secretary Legaré estimates the number of registered professional engineers now in good standing in the United States and its Territories at 217,000. Gentlemen, that is a sizable group. If my own state is a good average, the number of engineers applying for registration is increasing yearly. Our problems increase.

We are growing in terms of numbers. The question is, are we maintaining or—as we should hope—raising our standards and improving our practice of registration in keeping with the Purpose of NCSBEE as set forth in its Constitution and in line with continued scientific and technical development in the world? It has been predicted—and again let us hope this may soon become an established fact—that the day may not be far distant when all engineers, known as such, will be graduates of a qualified engineering school.

The statement has been made that the engineer's greatest asset is his reputation for integrity. Dr. William E. Wickenden, one-time president of Case School of Applied Science, in his often quoted "The Second Mile," described well the professional approach to engineering. Said Dr. Wickenden, "professional status is an implied contract to serve society, over and beyond all specific duty to client or employer, in consideration of the privileges and protection society extends to the profession."

As Examining Board members and as members of this National Council may we seek in our thinking, practices and decisions to keep the requirements for engineers whom we register on a high level, not only technically, but socially and morally also. The Opportunity and Challenge are before us.

President's Report—1958

Allen S. Janssen

As you may know, one of the constitutional requirements of the office of President of the National Council is the presentation of an annual report at this meeting in which the activities of

the year are recounted. There is a similar requirement that the Executive Secretary also report here on the activities of his office. Because these activities and those of the Council are so closely interwoven, it may appear necessary for me to stress or emphasize several items at the expense of some repetition.

Purpose of Council

Before proceeding I believe that it would be advisable to recall the purpose of this body as it is set forth in Article II of its Constitution. "The purpose of this Council shall be to promote the public welfare by improving professional engineering standards through efficient administration of State Engineering Registration Laws, by facilitating interstate registration of engineers, and by defining and maintaining national qualifications for registration." This statement of purpose has been reworded in the past and it may be modified at this meeting; nevertheless, it remains unchanged in intent. We should keep it uppermost in our thoughts as we consider any report by an officer, any report by a committee, and any action proposed to be taken by the Council at this or any of its meetings. Always must the question "Is this consistent with the purpose of this body?" be answered definitely in the affirmative.

Work of Standing Committees

In recognition of the fact that the work of the Council is accomplished wholly by its committees, I have believed that the total quantity of this work would be increased if the work of individual committees received considerable encouragement from the President. This I have tried to provide with a minimum of direction; I did urge that each committee limit itself to one or two areas rather than make an attempt to cover all areas that might well be embraced in its responsibilities. As a result, I believe that not only has the quantity of work increased but its quality may have improved. You will have to be the judge of this. There are at the present time eleven standing committees of the Council. I should like to mention them and their work briefly, realizing that all of them will report to you at this meeting in more detail.

Uniform Laws and Procedures. Under the able chairmanship of William M. Spann this committee decided to concentrate its efforts on a study of the Synopsis to recommend changes and additions to improve its use as a reference. This it has done and a revised edition issued to each Board. The recommendations of the committee in connection with the improvement of the Synopsis warrant careful consideration by every Council member.

Qualifications for Registration. This committee likewise concentrated its efforts in one direction, that of investigating the actual practice of the various Boards in evaluating the qualifications for registration of identical applications. There has been insufficient time during this short year to permit all Boards to perform these evaluations; it is hoped that this study can be completed during the coming year and that the data collected can be analyzed and presented in a manner that will be very useful. The Council is indebted to James A. McCarthy for his excellent work as chairman of this committee and to Thomas H. McKaig for the preparation of the applications.

National Bureau of Engineering Registration. This committee under the chairmanship of Thomas C. Shedd performed creditably much in the manner of the past. Because the report is always factual and brief, I fear that many of us are prone to assign far less importance to this work than it merits.

Engineers-in-Training. The work of this committee, headed by Robert B. Rice, has been involved with the collection of data regarding the E.I.T. examination programs in existence.

Excellent information has already been obtained and is reported by the committee but the study is not complete and it should be continued another year.

Engineers' Council for Professional Development. As a constituent member of E.C.P.D. the Council has been ably represented by this three-man committee. Past President Russell G. Warner, as chairman, has attended all meetings and reported immediately to your officers. It was upon his suggestion that efforts were made to include in our program this year a simulated E.C.P.D. inspection; unfortunately it has not been possible to make such arrangements this year. Your President, with the help of Past President Crouse, has enlarged the number of Council representatives in the listing of accreditation inspectors to increase where possible Council influence in the work of engineering education accreditation.

Finances. All matters relating to finances have been referred to this committee, chaired by A. L. Henny. Special attempts have been made to coordinate the work of the Special Committee on Future Operation of Council and the Committee on Constitution and By-Laws, as it pertained to finances, with this committee. Mr. Henny, former Western Zone director, has performed another very fine piece of work for the Council, being aided, of course, by a very fine and interested committee.

Constitution and By-Laws. About two years ago this committee commenced a rather comprehensive review of our Constitution and By-Laws. When the review was presented at the annual meeting last year there was considerable discussion and it was the consensus that some further study and changes should be made. Accordingly, Melvin E. Amstutz was asked to accept the chairmanship and continue with the study. Mr. Amstutz has put forth exceptional effort in his attempts to reconcile differences of opinion and remain impartial in the hope that any changes suggested would meet with the greatest possible approval. Working with the officers, he has personally explained the changes at two Zone meetings and arranged for their discussion at the remaining two meetings. Every attempt has been made to have the material prepared for a maximum amount of review and discussion prior to the annual meeting. No matter how one may personally feel about a particular recommendation made by this committee, let it not detract in any way from our realization that Mr. Amstutz and his committee deserve all of the credit that we can give them.

Land Surveying. This committee was unable to meet and organize at Atlanta and I have had considerable difficulty locating members interested in working in this area. R. D. Culbertson took over rather late in the year but there has been too little time in which to accomplish much. I am concerned about this committee in the future and would like to offer the suggestion that as part of the annual meeting this committee be allowed to sponsor a separate program much as the State Board Secretaries Conference. I believe that such a plan might have merit in directing specific attention to this area with its particular problems; the method in use today seems unfair to both those interested in this area and those who are not.

State Board Secretaries. For a number of years the work of this committee has been outstanding. O. B. Curtis, Sr., chairman this year, has long been interested in this work and his efforts, especially with the circulation of the Zone kits and with attempts to obtain information of value to Board secretaries, are commendable.

Nominations. No comment is needed here other than to report that recommendations for nominations have been promptly submitted.

Public Relations. This committee, under the chairmanship of C. P. Lewellen, chose to concentrate on the matter of issuing a brochure as a guide for Board members. Mr. Lewellen

prepared a tentative plan for such a brochure and it was circulated and discussed at all Zone meetings in the spring. Shortly after the Central Zone meeting, when his report had been submitted and he had laid plans for some publicity here at Milwaukee, his untimely demise took place. Although his work for this year was finished, as he would have wished it to be, the Council and the Iowa Board have lost a tireless and interested worker. I have already expressed our regrets to Mrs. Lewellen and the Iowa Board.

Special Committees

During the year, in accordance with constitutional authority and action taken at the last annual meeting, three special committees were appointed and asked to report at this meeting. A brief word about each appears to be in order.

Distinguished Service Certificate Awards. Robert N. Waid served as chairman of this committee in reviewing and nominating candidates to receive the Award this year.

Future Operation of Council. By Council action last year this committee's life was extended. Its membership consists of seven senior Past Presidents with Russell G. Warner as its chairman. The committee has done a great deal of work in view of the importance of its assignment.

Model Law Study. This committee, consisting of one member from each Zone and acting under the chairmanship of William M. Spann, chairman of the Uniform Laws and Procedures Committee, was appointed as a result of action taken at the Atlanta meeting. Without extensive discussion here, I should like to compliment Mr. Spann and his most active committee for the great amount of effort they have expended in such a short space of time. I know that you will appreciate this more fully when their report is made to you.

Zone Meetings

Immediate Past Presidents Stapley and Williams emphasized during their term of office their belief in the importance of the Zone meetings. I have shared this belief and, like them, I have supported and encouraged the principle of the Zone meetings. Accordingly, I was invited to attend and did attend all four of the Zone meetings in the spring. At each I attempted to summarize the work of the Council at the time and to discuss briefly items that should properly be introduced and discussed first at such meetings. In so doing, however, I pointed out many times that such matters should only take their fair share of time as the main purpose of the Zone meeting is to afford time for discussion and review of matters of regional interest. It would be possible, I suppose, for the Council progressively to take over these meetings; this would indeed be unfortunate. I believe that President-Elect Larkin holds these views also; he attended several of the meetings and is to be complimented for taking the time to do this. At this point, may I recommend that the Zones, through their respective Directors, coordinate the scheduling of the 1959 spring meetings with Mr. Larkin and the Executive Secretary so that all concerned may be informed and any conflicts resolved early. This type of planning has taken place last year and this year and it should be continued.

As I attended each Zone meeting I felt that it was indeed the best one that I had attended. After attending all of them, however, I realized that in the aggregate all were of equal caliber. They all differ in one respect or another but all are alike in the informality and the atmosphere conducive to frank discussion that was evident.

President-Elect

Past President Stapley pointed out last year that he was the first President to have been elevated to the presidency after having served as President-Elect. Following him as the second such President, I profited greatly from his own observations and recommendations. Every attempt has been made to keep President-Elect Larkin well informed throughout the year; I believe that he will be better prepared to assume office than any President that we have ever had. I mention this observation in support of the constitutional changes introducing the office of President-Elect a few years ago.

Official Visitations

As official representative of the Council, your President attended the Annual Meeting of the Canadian Council of Professional Engineers in Vancouver, B.C., early in May. By odd circumstance this visit to another country involved less travel distance than any of the other visits. My attendance was a very pleasant experience for me, having attended a prior Dominion Council meeting in Edmonton a few years back. The problems of our two groups are largely the same but I have been struck with the forward thinking of the Canadian Council particularly in matters of unity. Having fewer constituent bodies with which to reckon, 11 instead of 53, the Canadian Council has an advantage which it has used. In addition, it has observed our progress over the years and avoided some of our errors. We would be well advised, in turn, to observe and learn from the experience of our neighbors and friends. We are indeed fortunate in having Mr. W. O. Richmond, President of the Canadian Council, and Mr. Leopold Nadeau, Secretary-Treasurer, as our guests at this meeting.

It was also the privilege of your President, as the representative of the Council, to attend the Annual Meeting of the National Society of Professional Engineers in St. Louis in June. This was likewise a pleasant and profitable experience. We are honored to have Mr. Clark Dunn, President of the Society, and Mr. Paul Robbins, Executive Director, attend our meeting here as honor guests.

Invitations to attend the meetings of a number of other national engineering societies were received by your President. These invitations were sincerely appreciated although it was impossible to accept them.

Acknowledgements

No report to you about the Council's activities would be complete without recognizing and acknowledging the service performed by individuals in connection with these activities. Although I have already expressed by letter to the chairmen my personal appreciation of their efforts and those of their committee members, I should like to do so again here and publicly. From my account already rendered, I hope that you also can appreciate the fine work that has been done.

The support and advice received from individual Council members, from the Zone Directors, from the President-Elect and from the Past Presidents have been sincerely appreciated.

I cannot speak too highly about the aid I have received from our Executive Secretary, T. Keith Legaré. I visited his office in Columbia between Zone meetings in April and found, as suspected, a well-organized and efficient operation. I only wish that I could pay due tribute to Keith and his dedication to his work. To me at least he will always be Mr. National Council.

Without the cooperation of the Wisconsin Board and the Wisconsin Society of Professional Engineers the arrangements for this meeting could not have been made. We certainly appreciate this together with the efforts that Robert C. Johnson, General Chairman, Mrs. Johnson for the Ladies,

and the other members of the Committee on Arrangements have made to make our visit to Milwaukee a pleasant one in every way.

The Coming Year

From this account I hope that you will come to the conclusion that the year just closing has been a good one and that something more has been accomplished in attaining the purposes for which this Council was founded. It remains for each of us to rededicate ourselves to these principles and resolve that the coming year under President Larkin will be an even better one.

President's Report—1959
William H. Larkin

The year now being concluded by this Thirty-Eighth Annual Meeting will be remembered for the gracious hospitality of the Virginia Board and warm welcome by Lt. Gov. Stephens. It will also be recalled as the meeting at which the Special Committee on the Model Law held the spotlight. I wish to take this opportunity to thank the chairmen and members of the eleven standing and two special committees for the contributions they have made to the furtherance of the work of Council during this past year. It has not always been a simple matter to do the job assigned, and the results which will come before you as this meeting unfolds represent much personal sacrifice. I will let the reports speak for themselves.

It was my good fortune to attend all four Zone meetings. This schedule was made possible by the cooperation of the four directors working with Mr. Legaré to avoid a conflict. It was thus my privilege to attend in succession the Northeast Meeting in New York on April 11, the Western Meeting in Salt Lake City on April 24, the Central Meeting in Omaha on May 1, and the Southern Meeting at Gatlinburg, Tennessee, on May 8. In addition, I attended the Annual Meetings of ASME, NSPE, and CCPE. This latter meeting, held at Winnipeg, Manitoba, on May 19 through 22, was a thoroughly delightful experience. I was made to feel at home as I sat at their Council table and listened to discussions of topics very familiar to all of us "south of the border."

My report will deal primarily with three topics: First, I shall sketch the final chapter of the work of the Committee on the Future Operation of Council, then review the history of the Model Law briefly, and conclude with comments on the current financial status of Council.

The report of the Committee on the Future Operation of Council was presented to the Board of Directors at Milwaukee in August, 1958. It made certain specific recommendations which were approved at that meeting. A considerable amount of my effort during this past year has been directed toward its implementation. In essence, the report directed me to find a successor to our present Executive Secretary, who is scheduled to retire from active duty on or about July 1, 1960.

It seems fitting at this time to review the contributions to the profession made over a period of 36 years by Mr. T. Keith Legaré. He has served this Council as Secretary since October 1923, first on a part-time basis, and since October, 1945, full-time. He was our President in 1930–31, and as Executive Secretary of the National Bureau of Engineering Registration has issued 2,254 Certificates of Qualification. Also, as Editor of *The Registration Bulletin*, he has published 79 issues since September, 1939.

The Council has recognized the long and valuable service of its Secretary on two specific occasions. At the October, 1940 meeting, after eighteen years on Council, he was awarded the Distinguished Service Certificate. Then in 1948, following 25 years as Secretary, Mr. Legaré was presented with a special Resolution of Recognition and Appreciation, a copy of which can be found

in the Proceedings of the Twenty-Eighth Annual Meeting. It should be noted here that Mr. Legaré has now attended 36 consecutive Annual Meetings of this Council; he missed only the first two.

It is specially pertinent at this moment to remind this Council that Mr. Legaré is one of few, if not the only, individuals now active in the profession who can claim over 30 years of association with the development of the Model Law. His name first appears in connection with the Dec. 7, 1929 revision as a representative of this Council; it appears again in 1930, 1931, 1932, 1937, 1943, and 1945. He missed the 1959 meeting only because his doctor confined him to Columbia. He has made many contributions to the basic philosophy of the Model Law, and his counsel is still sought by those studying its possible revision.

Mr. Legaré has been active in many spheres of professional society work. He is a life member of ASCE, and of the South Carolina Society of Engineers. He has served as Director of the Civil Engineers, and as Chairman of their Committee on Registration. The South Carolina Society of Professional Engineers, at their June 1957 meeting presented him their initial award of "Engineer of the Year," and he also became their first life member.

He has served on the South Carolina Board of Engineering Examiners for 37 years, 35 of them as its Secretary. Currently he is Chairman. Also, here is a fact that few of us remember today: Mr. Legaré was the first Secretary of the National Society of Professional Engineers.

Mr. Legaré has another hobby, Boy Scouts. He has been associated with this activity for over 47 years, and there is hardly a professional man or otherwise, in Columbia today, who was not, at some time, "one of the boys." In 1932 he received Scouting's major award, the Silver Beaver. At present he is a member of the Executive Board and Chief Scout of the Central South Carolina Council.

When we think of Mr. Legaré, we think of him as "Mr. National Council," but there are home folks who remember him for what he has done for Columbia or for the State of South Carolina. For example, the following appeared in *The State* in Columbia, South Carolina, on Jan. 18, 1910: "Keith Legaré, as Superintendent of Streets for 18 months, made a record in street work unequalled in this city, achieved the remarkable and unprecedented feat of remaining within the appropriation for this department. . . ." He served his home city for over twelve years, also as Assistant City Engineer and then as City Engineer.

For eight years he was Southern District Manager for Dow and Smith, Consulting Asphalt and Paving Engineers of New York City. Then for over eleven years he served his State as Assistant Construction Engineer of the Highway Department. I suspect that Mr. Legaré has been responsible for many fine well-engineered South Carolina State roads.

He was Associate Engineer with the Corps of Engineers, War Department, on airports in South Carolina, during World War II, and then was District Manager of the War Production Board for his State for the next three years.

The Profession, and this Council in particular, owes Mr. Legaré a rising vote of thanks for his many contributions made over a period of 36 years. (All stood applauding.)

Following the Milwaukee meeting, I proceeded at once to the task of selecting Mr. Legaré's successor. I corresponded at length with the Board of Directors until March 18 an offer was tendered over L. E. McCartt's and my name to Dean James H. Sams. I received a letter of acceptance dated May 6, 1959.

In accordance with Article II, Section 5, of the By-Laws, "the Executive Secretary . . . shall be elected by the Board of Directors . . . He shall be subject to the direction of the Board of Directors, who shall determine his salary. . . ." His duties and responsibilities are clearly outlined in Section 5.

Dean Sams has been asked to assume his new duties on July 1, 1960, and he has agreed to do so. His selection was unanimous by the Board of Directors.

James Hagood Sams is a graduate of Clemson, obtaining a B.S. in E.E. in 1924; from Cornell he received an E.E. degree in 1926; and from the University of Michigan an M.S. in E.E. in 1931, and a Ph.D. in 1937. After the G.E. test course, he taught at Clemson from 1927 through 1934, at University of Michigan for two years, then back to Clemson, where he has been Dean since 1951. He took time out, 1941 to 1946, to serve in the AAF, with the rank of Colonel. He has been active in society affairs, he was a Vice President of ASME 1956–58, President of the South Carolina Society of Engineers, 1952, and Chairman of the South Carolina State Board of Engineering Examiners for several years and is now vice chairman. He has been active on this Council, he served as Director from the Southern Zone for three years from 1951 through the 1954 Annual Meeting. He represented us on ECPD for two three-year terms, ending at the October meeting of that Council this year. Also, he received our Distinguished Service Certificate Nov. 1, 1957 at Atlanta.

Model Law—Motion 42 of the Thirty-seventh Annual Meeting of Council held in Milwaukee last August adopted the report of the Special Committee on Model Law Revision. It instructed this committee to call a meeting of all interested parties, and to issue invitations over the personal signature of the President. These invitations, in the mail by Sept. 25, 1958, were sent to 31 societies and councils. Nineteen accepted, and sent at least one representative to the Feb. 12, 1959 meeting held in the ASME Board Room at 29 West 39th Street in New York. The following day the committee went into executive session and made remarkable progress toward the completion of a revised draft of the Model Law. This meeting on Feb. 13 was held in the ASCE Board Room; through the kindness of Mr. L. E. Chandler we obtained the services of Mrs. Reynolds of his staff to record the Minutes of the meeting. This Council owes this committee a special vote of thanks, to its Chairman, William M. Spann; its Vice Chairman, Robert Williamson, Jr., who carried on in the Chairman's absence during the winter; and to each member for the report given at his respective Zone meeting.

Historically, the Model Law goes back almost 50 years. ASCE drafted such a law in 1911. Four years later six national societies got together and produced a revised draft in 1915. The present series of cooperative efforts to produce a Model Law dates from 1929 when this Council, ASCE, ASME, and AIEE, plus two other societies, the AAE and the AREA met to review a "Recommended Uniform Registration Law for Professional Engineers and Land Surveyors," written by the Standing Committee on Registration of Engineers of ASCE. Similar meetings were held every year through 1932, then in 1937, 1943, and 1945. The number of participants grew from six in 1929 to fourteen in 1945.

Counting the Chemical Engineers as a founder society, all five have participated since and including the 1932 meeting. However, it is interesting to note that 1945 marks the first time that all five officially endorsed or adopted the Model Law resulting from this cooperative effort.

Financial Picture—In July, 1929, our total assets were $353.87 cash in the bank. Since that time we have grown in strength and numbers, also we have assumed the responsibilities of a mature Council. We have a retirement fund of $22,582.41 to cover pension obligations built up over many years of service, we have a reserve fund of $12,343.40 designed to cover such non-recurring expense items as the transition to a new Secretary and possibly a new location. However, operating expenses caught up with income last year. As of Dec. 31 we were faced with a cash deficit of $654.42, even though we deferred payment for the 1958 year book, then two

months overdue, and added nothing to our reserve fund. To meet this situation, we withdrew $1,000.00 from our Reserve Fund and placed it in our current cash account.

The new schedule of fees went into effect last January and the response has been most gratifying. A comparison of receipts and the budget as given below indicates an operating surplus for this year of $3,733.50:

	Six Months Jan. 1–June 30, 1959	Budget 1959
Receipts		
Member Board Fees	$17,562.50	$19,000.00
National Bureau Engineering Registration	4,116.00	5,000.00
Registration Bulletin and Publications	355.00	100.00
Annual Meeting Registration Fees	0.00	800.00
Engineering Societies, Publications and Services Rendered	2,950.00	2,900.00
TOTAL	$24,983.50	$27,800.00
Added Receipts Expected Before End of Year		
Member Board Fees	$3,250.00	
Registration Bureau Fees	3,000.00	
Participating Organizations—		
3 new members	300.00	
TOTAL	$31,533.50	
Surplus Expected Receipts Over Budget		3,733.50
		$31,533.50

However, the $1,000 borrowed from the Reserve Fund has now been repaid. Also, since our Annual Meeting now comes in August, the bill for printing the Proceedings falls due in October. I recommend that this bill be paid when rendered this year; we will, in effect, be catching up on an item that we have deferred in the past. Our net available surplus, out of which a transfer to the Reserve Fund can be made, will be as follows:

Net Available Surplus for Year 1959		
Surplus, Expected Receipts Over Budget		$3,733.50
Extraordinary Expense		
1. Return of monies to Reserve Fund, withdrawn in December 1959 to maintain cash balance	$1,000.00	
2. Payment for 1959 proceedings in this calendar year	1,400.00	2,400.00
Net Available Surplus		$1,333.50
Note:		
Cash balance January 1, 1958		$319.00
Cash balance January 1, 1959		345.58
Expected balance January 1, 1960		1,679.08

This current financial picture is a vast improvement over that which had developed last year under the old schedule of fees. However, we are faced with a rising spiral of costs, therefore, let us look at a hypothetical budget for 1965:

Hypothetical Budget—1965

Cash Receipts	
Member Board Fees	$25,000.00
National Bureau of Engineering Registration	7,500.00
Registration Bulletin	100.00
Engineering Societies	3,200.00
Annual Meeting	1,000.00
Total	$36,800.00
Cash Disbursements	
1959 Budget	$27,800.00
Additional 25 percent	6,950.00
Surplus	2,050.00
Total	$36,800.00

If our costs rise an average of 5 percent above present figures for each of the next five years, it is interesting to note that the amount available for contingencies and transfer to surplus is our old friend $2,000.00. In fact, our 1958 budget showed this item at $1,000.00 and we finished the year just $654.42 in the red. A $2,000.00 figure is virtually a break-even amount, and we should plan our housekeeping with that in mind.

In January I visited headquarters at Columbia, South Carolina. Council operations were moving smoothly and efficiently in the experienced hands of Mr. Legaré, Miriam Gibbons and Mary Law. While there, the question of the lease arose and was settled on an advantageous basis for an 18-month period, to July 1, 1960.

Unfortunately, my visit coincided with the inauguration of the Governor, so I deferred to the Charleston contingent and moved out to the motel on the edge of town. I am certain it was much quieter there than at party headquarters in Columbia. I heard that the band I thought Keith had sent to the station for my benefit worked far into the night.

It has been a pleasure to serve as your President this past year, and I can assure you that such success as may have been attained is the result of the combined efforts of a very capable corps of committee chairmen, needled and encouraged by Keith. I thank them one and all.

President's Report—1960
Lawrence E. McCartt

To determine the progress of an organization it is necessary to view the accomplishments attained over a period of years. It often appears that very little if any advancement is made when viewed on a year-to-year basis. Perhaps this seemingly slow progress is well if we are to believe the old adage, "He who rushes passes more than he catches up with."

It was a privilege to attend my first Annual Meeting of Council in St. Louis, Missouri in 1946. Therefore, an attempt will be undertaken to compare conditions existing in 1946 with those of 1960.

It is not the intent to enter into a detailed comparison. Many phases of Council which have shown progress may or may not be mentioned.

Registrants

In 1946 Council was composed of fifty Boards. This number has now increased to fifty-three.

In 1946, according to the Chart in the Year Book there were about 92,000 registered engineers. According to the 1950–1960 Year Book there are nearly 240,000 registered engineers, an increase of 261 percent.

Finances

The total of the Budget for 1947 was $14,000.00. This year, 1960, the Budget anticipated an income of $31,500.00. From the Financial Statement for the first six months of this year, and printed elsewhere in the Proceedings, this goal will be attained by the end of the year. The cooperation of the Member Boards and the Participating Organizations in the prompt payment of fees has made this record possible.

Zone Meetings

The first Zone Meetings were held during the Annual Meeting of Council in 1947 at New York. The first Interim Meeting was held by the Central Zone in 1948 at Columbus, Ohio. In 1947 all of the States bordering Illinois were invited to Springfield, Illinois, to discuss problems of registration. This is considered to be the first Interim Meeting of the Central Zone.

In 1960 all four of the Zones held Interim Meetings, that being the custom for the past several years. The lengths in time of these sessions varied from one to one and one-half days. Subjects and problems of significant importance to all Registration Boards were discussed in detail. Information concerning such matters as "Common Examinations for Engineers-In-Training," "Common Examinations for Professional Engineers," "Cost of Examinations," and so forth, was presented.

There is a lack of uniformity as to the length of the meetings, activities pursued and methods of reporting the results. There should be some coordination in the programs of the Zones. Reports of the results attained should be made available to all concerned. The accomplishments of the Zones are too important not to be publicized.

The meetings afford an opportunity for the Board members to become acquainted, discuss their common problems and eventually find a solution to them. This has resulted in the advancement of the uniformity of operation by the State Boards.

Model Law

After two years of exhaustive work the Special Committee on Model Law Revision will submit a final report embodying the results of the study. Every effort has been made, including the employment of competent legal talent and consultation with the Societies and Councils, to provide a Model Law acceptable to all concerned. There are controversial provisions which required considerable thought and revision before they were acceptable to the Committee. It is certain there will be many persons and organizations dissatisfied with the report. However, it must be remembered, and borne in mind during the discussion of this report that:

1. A Registration Law is for the promotion of the public welfare.
2. The Model Law is suggestive as to form and contents. The wording need not be followed, provided the purpose is attained.
3. The purpose of the Model Law is to promote uniformity of purpose and procedures in the field of Registration.
4. It is possible that the desirability as to the contents may vary considerably between the various State Legislatures and what we propose here. In some instances, if not all,

acquiescence will have to be made to conform to the State Laws and/or to the wishes of the Legislators.

The Committee on Uniform Laws and Procedures should, in the future, maintain the Model Law to meet the conditions of the changing times. To forget about it for many years, eventually necessitates so much exhaustive work that other important functions of the Council may be neglected during the period of study.

It is significant that the present Model Law, followed by many states in the preparation of their registration laws, was completed and accepted in 1946.

Executive Secretary

On July 1, T. Keith Legaré retired as Executive Secretary of Council after serving in this capacity for nearly 37 years. Mr. Legaré will receive $2,400.00 per annum, paid in installments of $200.00 per month for the balance of his life. These payments are to be made from the Retirement Fund established for this purpose. The Council entered into an agreement with Keith at the Annual Meeting held in Colorado Springs, Colorado, September 5, 1952. This agreement was later amended in Atlanta, Georgia, November 1, 1957. The purpose of the amendment was to increase the amount payable from $1,800.00 per annum to $2,400.00. In retirement, he is to serve as a Consultant to the Council.

In June of this year Keith was reappointed to the South Carolina Board for a five-year term. He has served on this Board continuously since the passage of the Registration Act by South Carolina in 1922.

This is the first Annual Meeting he has missed after attending 36 consecutive meetings. The doctor has restricted him as to long distance travels or he would be here. He expects, and may his expectations be fulfilled, to be present next year in Biloxi.

On July 1, Dr. James H. Sams, formerly Dean of Engineering at Clemson, assumed the office of Executive Secretary. The Secretary's office has been established in Room 216, Civil Engineering Building, Clemson, South Carolina.

Miss Miriam Gibbons moved from Columbia to Clemson in order to continue her services with the Council. Mrs. Mary Law remained in Columbia with Keith and the South Carolina Board.

The Council has been fortunate in having Keith Legaré for the past 37 years as a leader and director. The good fortune was extended when James Sams agreed to accept the post vacated by Keith. His experience, gained in the field of education, on the South Carolina Board, in participation in the affairs of the National Council, and familiarity with the various Societies and Councils of Engineers, makes him exceptionally well fitted for the job of Executive Secretary.

In 1946, this change could not be foreseen. However, could it have been, the change-over could not have been made more smoothly and satisfactorily than it has been with only one year for the necessary preparations.

Joint International Committee

Progress is being made through the efforts of the Joint International Committee of CCPE and NCSBEE to create a satisfactory relationship between Canada and the United States in regards to the interchange of engineering practice.

The Joint Committee met in Saint John, New Brunswick, on May 10, 1960. NCSBEE was represented by Newell L. Freeman of New York, and Dr. James H. Sams, Executive Secretary. A second meeting was held Wednesday morning, August 17, in Portland. Mr. Freeman will present a report covering the activities of this Committee during this meeting.

Council

In the 14 years, since the meeting at St. Louis, Missouri, much has been accomplished to bring all of the Boards closer together. Board members are better informed and there is more uniformity in the procedures being followed. Reciprocity or comity is not the problem today, as it was in the past. We are still confronted with problems, but time and an honest effort to solve them will eventually bring about their solution.

Without the National Council, the relations now existing between the State Boards would be non-existent. Each Board would be going its own way with little or no conformity to the higher standards of registration. The Council has assisted each of us in doing a better job of protecting the welfare of the citizens of the State we represent.

The competent engineer may cross State lines to carry on the work of his profession without encountering too much difficulty in obtaining registration.

I wish to take this opportunity to express my sincere thanks to the Board of Directors, the Committees and all others who have so generously supported the work of the Council during the past year.

Mere words cannot express my appreciation of the work performed by T. Keith Legaré and James H. Sams. One could not expect more cooperation than these two have given. It has been a privilege and an interesting experience to serve the National Council as President. I thank you for the opportunity of serving and enjoying so great an honor.

President's Report—1961
O. B. Curtis, Sr.

We, your officers and Members of the Board of Directors, have conducted the affairs of the Council in full compliance with the provisions of the constitution, and in a manner that serves to accomplish the purposes which justify the existence of this Council. My own concept of proper conduct for the Board is that even though your Board may have full authority to act upon an issue brought before it during the interim period between meetings, if the issue is known to be controversial or if there is reason to believe that substantial divided opinions exist, then the matter should be brought before the delegates of Council for action. This is based upon a general principle that the reasoning advanced by a minority may substantially improve the final acts of the majority. The exception would be where time is of the essence, and therefore requires a prompt decision.

As for accomplishments, there is one accomplishment that we have all made and of which there can be no doubt whatever—we have all added a year to our experiences—we have grown a year older.

Sometimes we become obsessed with the idea that we can and need to arrive at the solution to a weighty problem here and now—to settle it once and for all, when as a matter of fact the problem may need continuous or periodic attention. Let me illustrate by quotations from our past proceedings—compare them with our most recent discussions.

Today, one year after the adoption of the Model Law in Portland, we are concerned with possible improvements in certain sections, and properly so. In 1937, during our meeting in Scranton, Pennsylvania, the late and highly esteemed Dr. D. B. Steinman of the New York Board pleaded thusly: "I, therefore, ask for support of my motion, which is that we approve the model law, subject to the correction of the definition of professional engineering, as I have indicated, back to the old form of the definition, plus any revision which may be necessary in sub-section 'D' of Section 22 of the act."

The background for this first quotation is that ASCE had compiled a revision of the model law, and had invited the Council among others to endorse it.

Again from the 1937 proceedings with reference to ECPD, and I quote "I cannot see why you want to carry on ECPD if you are not going to do anything with the schools recommended. If these Boards are going to follow the course of accepting these, and then any others they want, then we are right back where we started."

Then, from the 1935 proceedings on "Reciprocity and Certification" and I quote, "From the foregoing investigation, it is deemed safe to assume:

A. The procedure and attitude of States

1. A majority of the Boards are opposed to making the National Bureau the sole means of effecting reciprocity."

"as to functions of the National Council, majorities felt that (parenthetically, these are priorities on the functions of council).

The prime function was for exchange of ideas, next, the facilitation of reciprocity, then consideration of uniform operation in the various states, then uniform registration laws, then types of examinations."

Also the earlier work on Uniform Examinations are filled with discussions leading to formulating syllabi, extolling the pit-falls of unbalanced or weak examinations, discussing their validity, etc., and preparing specimen examination problems.

Quoting from some of the earlier discussions serves three purposes. First, the chain of sound thinking and of viewing the relative values of certain procedures in their true proportions can be seen easily and remains unbroken through the years. Secondly, the resulting actions of Council have been made more lasting by pooling experiences and thinking of the delegates both through reports and through discussions following the reports. Third, when an individual member wants to explore or discuss a subject, he can usually derive great benefit from reading the reports and discussions on that subject. The ideas, often expressed extemporaneously, are expressed clear and unusually well, and the discussions are thorough. You will find, in many cases, that the question that you are "throwing out for discussion" has been answered well on multiple previous occasions. I recommend the former proceedings to you as book-of-the-month reading on subjects dear to your hearts.

Amalgamation of EJC and ECPD

As a constituent member of ECPD, we were asked last fall to vote on the proposition "to approved in principle" the amalgamation of EJC and ECPD into the *American Engineers' Association*. Your President decided immediately that this matter should be placed before the Council in Regular Session, especially since our vote may well decide the whole proposition and since the votes of the other constituent bodies bore proof of division. This matter was presented to each of the four zones at their spring meetings. The Zone Directors will report their actions. Moreover, the Board of Directors discussed the matter yesterday. Your President-Elect, Mr. Henny will give you a report of all Board actions, when called upon today. You will be given the opportunity to discuss this matter and to decide our official position later on in this meeting.

Membership

Five membership actions have been brought before the Board of Directors this year. The Board's actions will be reported to you soon, following which you will be requested to take appropriate action.

The Guam Board of Engineering and Architectural Examiners, established by the Fifth Guam Legislature in the 1960 (Second) regular session has made application as Member Board.

The American Institute of Mining, Metallurgical and Petroleum Engineers, AIME, and the American Institute of Industrial Engineers, AIIE, have made applications for membership as Participating Organizations.

The application of the Committee on Engineering Laws for membership as a Participating Organization was postponed until 1961 for additional information. The information has been received.

The Texas Society of Professional Engineers transmitted a letter of resignation as a Participating Organization.

Model Law, 1960 Revision

Those National Engineering organizations who participated in the Panel Discussions in New York, and who, through their committees, attorneys and/or other personnel discussed, reviewed, and contributed reports or statements for the Council's committee to consider were all requested by the Council to formally endorse the 1960 Revisions of the Model Law. Our Executive Secretary will report the results.

Summarizing, it is abundantly clear that the provisions of subsection "D", of Section 22, relating to corporate practice cannot be written to satisfy the profession. Some groups violently oppose its present wording. Others are pacified but not satisfied. The definitions of Professional Engineer and Practice of Engineering are always under attack. Based upon Zone actions, which will be reported to you later, this subject will definitely be presented for action during this meeting.

I have four comments in that regard, two of which are opposite in nature. First, the 1960 revision, Chapter I, represents a four-year effort, during which the Committee held two special meetings to discuss the proposed provisions profession-wide. These discussions actually caused the rewriting of several changes and other proposals were deliberately considered and rejected, either on the general basis of composite decision or on the basis of enriched experiences. The revised edition has been published and widely distributed (by demand), endorsements have been requested, and in some groups proposed endorsement action has not yet been finalized. If we amend, amended copies will be published, we will have two versions before the public, and will have to notify the endorsers of the changes, and request reendorsement. Do we owe those from whom we sought and obtained counsel an opportunity to at least comment and possibly improve on important revisions before we adopt them? Secondly, and diametrically opposite from that thought, we were reminded at Portland during the presentation "Therefore, by majority vote, the Council can amend or revise the document at any time through its committees." Several who voted for the revision, bore that truth in mind, and in fact we all want to see the document amended when proof of betterment has been presented.

Third, some professional organizations were not too happy to find that our procedures at Portland called for adoption or rejection of the document without subjecting it to further changes at the time. I hope that they realize that the restrictions against presenting changes were also applicable to the Council's own Member Boards and their delegates.

Fourth, I have full faith in the fairness of the principle of presentation, discussion, decision and accepting the decision—as practiced in our Sessions.

Zone Meetings

Your President, following the example of several predecessors, attended all four Zone meetings. More than one of the Zones had in attendance a majority of all Board Members of the Zone. The groups are smaller, the meetings are more informal, their problems are more closely related, the delegates have a better knowledge of neighboring customs, laws, etc., and the results are wonderful. It was a special privilege to sit in the session with the group from the Northeast

Zone and watch their processes of putting together a common examination for Professional Engineers. The Southern Zone inaugurated its Certificate of Recognition. While attending the Western Zone meeting in Seattle, I was also privileged to meet with and address the Pacific Northwestern Section of the American Society for Engineering Education at the University of Washington. The Westerners apparently overcome their generous distances by holding simultaneous meetings of kindred nature. This has several advantages and only one disadvantage. Some men are due in two or three places at exactly the same time—and they nearly make it. A highlight of the Central Zone is the thoroughness of their proceedings. They utilized the services of Mrs. Lena Beck, who has efficiently recorded the business at more than a score of our annual meetings.

The time has arrived when Council needs to record the principal actions of the Spring Zone Meetings in its proceedings. The job could be completed and in type before our Annual Meetings proceedings are transcribed. I recommend that you make provisions to do that.

Meetings, of Other Professional Groups

ECPD—I attended the 1960 ECPD meeting primarily to get information for our Board on the proposed amalgamation, on which we would vote, to get information on the progress of the expanded membership, and because we are a constituent body of ECPD. Chairman Evans of our Committee will give a full report on that meeting.

ASEE, Southeastern Section—I attended the meeting of this group at the University of Mississippi. It was an opportune time while they were meeting in the State, and I wanted to get useful information for the presentation at the University of Seattle before a similar group.

Canadian Council for Professional Engineers—I attended the 1961 annual meeting of CCPE in Edmonton, Alta. Their registration problems are very similar to ours. The International Committee met and arrived at certain points of agreement as a beginning.

They met again yesterday here in Biloxi. Newell Freeman, Chairman of the Council's part of that committee will give you a report on their meetings. I recommend that you provide for continuance of this committee.

I requested President-Elect Henny to represent Council at the NSPE meeting in Seattle, and our Executive Secretary, Dr. Sams, to represent the Council at the ASME meeting.

Council's Office in Clemson—The Executive Secretary and his staff have been very busy this year. Dr. Sams will report on their activities. Miss Miriam Gibbons, Secretary for many years resigned during the year. As a matter of policy, I did some independent inquiring and can now assure you that her resignation was for reasons of a personal nature. We will miss Miss Gibbons and her good work. There is every indication of efficient operation in the Council's office. The cooperation with the President, the officers, and with Committee Chairmen has been complete. President-Elect Henny visited the office during the year, in connection with a vacation trip, and I saw no reason to duplicate the visit.

Financial—Certified public accountants Clarkson, Harden and Gantt furnished me with their original copy of a *Report on Examination of Accounts* of the Council for the period January 1, 1960 to June 30, 1961. This report was found to be satisfactory, and is included in the Secretary's report.

Retirement Plan for Executive Secretary—As reported to you at Portland (1960) the Board directed the incoming President to appoint a committee from the Board to bring forth a plan to provide funds to meet the accruing obligation for retiring the next eligible Executive Secretary. This I did. As reported on Page 22 of the Portland proceedings, "The Board is not creating a new obligation of Council in this regard, but instead, is studying the business aspects of this accruing

obligation of a policy already approved by Council and which was a consideration in the original employment of Dr. Sams."

In a loosely knitted organization, such as ours, where the ordinary actions of Council are not binding, I did not consider it appropriate to furnish restrictive instructions to a committee from the Board, all of whom are old timers.

They have come forth with a proposed plan which will be presented to you by Moses E. Cox at the proper time.

I have one comment—Dr. Sams is growing older with each passing minute and we need to arrive at a decision.

The Future—Reliable statistics on the subjects and all predictions indicate beyond reasonable doubt that Engineers of the future will have and accept broader responsibilities and more important roles in the progressive affairs of our nation. There will undoubtedly be steady growth in numbers. To a conscientious Registration Board Member this can mean but one thing, MORE WORK. The time has arrived when we must actively police the profession to safeguard the rights of those who practice with honor in its name; and we must also maintain a constant vigilance to eliminate the unfit who seek to practice in the name of our profession. In these undertakings we have a right to expect assistance from our societies, and we have a duty to advise and work with them. To sum this up our future holds plenty of hard but rewarding work in store for us.

Acknowledgments

I would now like to make some acknowledgments of appreciation. First, it is with great pleasure that I express for the Council and myself to our host and my fellow Board Members the Mississippi State Board of Registration for Professional Engineers, our appreciation for their part in planning this meeting. I would like especially to thank Mr. Robert L. Morrison and Mrs. Morrison, who worked together with a committee from the State Society of Professional Engineers in planning the local program and the entertainment for this convention. Mr. M. M. Gautier, Chairman of the Societies committee, and Mrs. Gautier did most of the local work. I will acknowledge their fine work at the Banquet.

I wish to express my appreciation to the Members of the Board of Directors for their attendance and good work at meetings, and for their courtesies extended to me at the Zone meetings.

I wish to express my appreciation to Messrs. L. T. Schofield, C. V. Waddington, George F. Branigan, Leo W. Ruth, Herold E. Murdock, Edwin R. Whitehead, Edward C. Dohm, Moses E. Cox, Robt. Williamson, Jr., Arnold M. Steffes, Clarence H. Evans, Newell L. Freeman and Past President L. E. McCartt for their year's work as chairmen on the several committees of Council. As all of us know, a goodly portion of the progressive work of this Council stems from Committee Reports and the ensuing discussions.

Representing the Council, I want to thank the founder Societies and those other Engineering associations that have in the past and are now lending support to the Council by sending representatives, furnishing financial assistance in the purchasing of bulletins, etc., and by giving us the benefit of their counsel.

Finally, I must express my appreciation for the honor and privilege I have enjoyed while serving as your President. It has provided me with broader acquaintances, enriched experiences, and greater fellowships which I shall never forget.

I thank you.

President's Report—1962
Arnold L. Henny

Since far the greatest part of the work of the National Council is performed by its committees, this is naturally the field of greatest interest. And in this field, the newly created Model Law Revision Committee is tackling the most controversial issues. As you recall, the Council revised our Constitution and Bylaws at the Biloxi session to provide for this new standing committee. The staffing of this committee required a delicate balancing of interests, so that there could be no thought of loading it in any way, and after a month of deliberation, the present committee was appointed. The fact that it is a good committee, and well chairmanned by Bob Rhinehart will probably become evident when he presents his report to Council later today. Personally, I am very pleased with what they have accomplished, and in what they have not tried to accomplish in less than a year in which they have functioned. The more controversial problems facing the committee simply could not be resolved in such a short period of time.

Special reference to the Finance Committee, chairmanned this year by J. W. Beretta is also in order. The affairs of the Finance Committee during the year are usually referred directly to the Executive Secretary, President and Board of Directors, so that the majority of Council have little appreciation of the real job done. Two major problems faced the committee this year, and both required the ability of a financial expert. The first concerned the proper investment of our reserve and retirement funds. I had felt for years that our investment policy should be overhauled and the committee immediately faced up to this responsibility. Their recommendations were so obviously correct that we conformed at once and I now feel that our policy of investment will stand the most critical scrutiny. The details are given in the committee report and that of the Executive Secretary.

The other major point of consideration of the Finance Committee was the retirement policy for our Executive Secretary, which had been under study for two years without reaching any final conclusion. The results of their deliberation are given in the committee report, and I hope that favorable action may be taken at this meeting. The Council is fortunate to have a man of Mr. Beretta's ability and willingness to perform this task.

The other standing committees fall more in the line of routine working groups, and I believe that their reports to be given today and tomorrow will maintain the high standards usually expected of our committees. It is obvious that a great deal of work and thought has gone into these reports, and that all have earned the appreciation of Council. I particularly want to thank Mr. Cobb for assuming the chairmanship of the State Board Secretaries' Committee, under most difficult conditions following the unexpected death of Mr. Piper; and Mr. Shaver for continuing his chairmanship of the Uniform Laws and Procedures Committee, although not reappointed to the Nevada Board after twenty-three years of continuous service.

Special Committees

The Awards Committee and the NCSBEE-CCPE Joint Committee are the two special committees functioning this year, and both have served Council well.

Meetings

Your officers and committee members have been active in attending meetings throughout the past year. Mr. Sams has attended three Zone meetings, the meeting of the NCSBEE-CCPE Joint Committee held in Quebec City, and the annual meeting of the ECPD. Mr. Shaver, Chairman of the ECPD Committee has attended faithfully all meetings of that committee. Mr. C. H. Evans attended the annual meeting of ECPD and two meetings of the executive committee in New York

City. Mr. Freeman, Chairman of the NCSBEE-CCPE Joint Committee, also attended the meeting held in Quebec City. Mr. McCarthy attended the meeting of the Southern Zone, as well as presiding over the Central Zone meeting. I attended two meetings of Engineers and Surveyors in California, two meetings of Surveying and Mapping in Washington, D.C., the 75th Anniversary Convention of the Engineering Institute of Canada, held at Montreal, Canada, the annual meeting of the NSPE held in French Lick, Indiana, and all four Zone meetings. At all of these meetings, our attendance and participation were appreciated, and I believe were a benefit to the National Council.

Zone Meetings

It is a revelation to me how the Zone meeting has evolved to become a major function of the National Council in the short time since it was first instigated. There appears to be a trend to pattern these meetings after those of the National Council, whereby the work is done by committees which report at the Zone meeting. Originally conceived to encourage discussion of Zone problems in a detail not possible at the national level, all zones now give considerable time to discussion of problems posed by the National Committees—in other words, national business. This is very beneficial to the whole Council, but encroaches somewhat on the time available for Zone business. The obvious answer was to extend the time of the Zone meeting. This year, for the first time, the Western Zone expanded to one and one-half days, which resulted in the best meeting yet. Two-day meetings would probably be ideal, as this would give more time for personal contacts outside of the formal meetings. All of this year's meetings were well attended, and each Zone accomplished an outstanding amount of work, as is well attested by the published minutes which are now available. The presence of Director McCarthy at the Southern Zone meeting pointed up the desirability of more cross-attendance at these Zone meetings. His attendance at Austin gave us a quorum of the Board of Directors, and we were able to meet unofficially and discuss several urgent problems which could not await the Kansas City meeting.

Other Business

During the year there was a normal flow of business requiring special action. Those matters which could be decided by the Executive Secretary or the Executive Secretary and the President, were so decided. Those requiring Board action were referred to the Board by mail, and certain subjects of more controversial nature, and important to Council, were placed on the agenda for discussion at this meeting. These latter items will be reported upon by our President-Elect later today.

Acknowledgments

I now wish to thank the committee chairmen and all committee members that served Council so well in carrying forward its work, and to thank the Board members, and especially President-Elect Evans for all of the help they have given, and the promptness with which they have responded to all requests. And especially do I wish to express appreciation for the smooth functioning of the Executive Secretary's office under the guidance of Jim Sams, ably assisted by Mrs. Julia Cato and Mrs. Geneva Lawless. I have been amazed constantly by the large volume of work handled, and the many decisions made by the Executive Secretary, all done so quietly and apparently effortlessly as to make this really difficult job look easy.

President's Report—1963

Weston S. Evans

As President of your National Council I find myself at this moment in a somewhat peculiar situation. Section 2, Article II of the Bylaws reads as follows: The President shall, when present,

preside at all meetings, shall appoint all standing committees and shall present to the Council at the Annual Meeting a report of activities during the term of his office. The dilemma arises since it is not stated whether I am to report on my activities, committee activities, the Secretary's activities or some other activities and I prefer to report none of these. Since the Secretary and the committees do all the work, I prefer to let them speak for themselves. While I will speak briefly on what I have done and of some things that may be of interest to you, I prefer to spend most of my time looking ahead with you.

General Statement

As you will see from the report of Secretary Sams, we have operated closely according to our budget and our financial situation is satisfactory. We could work more effectively if we had more funds. I refer especially to the need for funds to finance additional committee meetings and a mid-year meeting of the Directors. This does not mean that all committees should meet during the year, but occasionally an additional meeting would be very helpful as I will point out later. It may be difficult to raise more funds without offering more direct financial benefits to individual State Boards. This can be done through the medium of uniform examinations.

Our standing and special committees have performed their tasks well and most of them will present a report at this meeting.

Activities

Representing the Council at various functions, upon invitation, is one of the duties of the President. I personally attended three Zone meetings, the Annual meetings of ECPD, AICE, AIIE and NSPE. One of this latter group conflicted with the Central Zone meeting and was too close to the Canadian Council meeting for me to attend. Besides representing the Council at three Zone meetings and the Annual NSPE meeting, Secretary Sams represented us at those two meetings. We were represented at two Inaugurations of College Presidents by members of our ECPD Committee. Those experiences were delightful but they required many miles of travel.

As a special committee activity, I should mention the Chicago meeting sponsored by the Model Law Committee last December. You will hear more about this meeting in the report of the Model Law Committee but I mention it here as a special committee activity to illustrate the need for additional committee meetings in special cases.

I would also mention the mid-year Director's meeting held in Mobile. In 1962 President Henny called a meeting of the Board of Directors at the time of the Southern Zone meeting since a quorum happened to be present. As this meeting was very worthwhile, I asked those Directors who could to come to Mobile this year. The response was excellent and the meeting so successful that it now seems that such a meeting is almost necessary.

I would recommend that these mid-year meetings be continued. Since we have no travel funds for directors, I would suggest that the registration board of which the director is a member be asked to pay the expenses of its director to one extra meeting each year. I believe that having a board member serve as director is well worth this added expense.

At the last Annual Meeting I was instructed to appoint a committee to consider the feasibility of common examinations at both the basic and professional levels. This committee was appointed with Richard Hankins of the Virginia Board as Chairman. Mr. Hankins organized the first common professional examination for the Northeast Zone and I consider highly his opinion as to how such examinations could be made up for use either nationally or in a zone. However, due to unexpected demands of his business, he found it impossible to get an early start. Past-President Henny took over

about the beginning of this year. The committee now consists of Donald Marlowe of the District of Columbia, W. E. Bryan of Missouri, George Branigan of Arkansas and Arnold Henny of Oregon as Chairman. The work is now moving along and Past President Henny will report at this meeting.

I have appointed, also, under instruction by the Board at its April meeting, an ad hoc committee to draw up a statement of educational policy for the Council. As this committee has been appointed only recently, it cannot make a report at this time. The same personnel will continue under President Spann and is as follows: Carrol Beeson of California, Chairman; Chester Arents of W. Virginia, Vice-Chairman; A. W. Weber of New York, Melvin Amstutz of Illinois, Ben Bogard of Louisiana, Orland Mayer of Idaho, Cornelius Wandmacher of Ohio, and Douglas Ragland of Texas.

One other area of activity is worthy of note. Being President of your Council is an honor, a pleasure and also an educational process. By the time one finds out what is going on it is too late to do much. I believe we are on our way to help this situation.

The mid-year meeting is the key to a successful solution of the problem. President-Elect Spann's Board made it possible for him to attend all zone meetings as well as the Director's meeting. Jack Beretta, the next President-Elect, also attended all zone meetings and the Director's meeting in Mobile. If this procedure can be continued a high degree of continuity can be achieved. The attendance of these men came about this year through good-fortune and the kindness of their boards but extra effort may be necessary to assure the attendance of the President-Elect at the Director's meeting and all zone meetings next year.

Greater Uniformity Is a Must

Some boards may question the value or the accomplishments of this National Council. If there be such, let them pause for a few moments and consider the condition in which the registration movement would find itself had it not been for the untiring efforts of this Council. In spite of all that has been done, great differences exist among the boards, not only in their procedures but in their requirements and in the effectiveness of their requirements.

I will point out a few. Some boards do not recognize a National Bureau Certificate. This is of great concern to engineers who need to get registered in several states. Some require written examinations and some do not. Some require references from registered engineers in the state where registration is being sought. This can prove very troublesome. There are variations in age requirements, residence requirements, citizenship requirements; in fact, almost every requirement which can be mentioned. We will never reach that Utopia where all State laws will be, and will be administered, the same. However, we can improve.

A study of the standing committees of this Council reveals that our main effort is directed toward uniformity—both uniformity of laws and uniformity of procedures. I plead with all the standing committees to spare no effort to bring about greater uniformity; and I plead with all board representatives to strive towards that common goal—uniformity.

As I have attended many meetings this year, I have found the sentiment for uniformity, indeed for National registration, very strong. I'm afraid that if this sentiment continues to grow some form of certification at the National level may appear. In these times of unlimited mobility, the registration requirements and procedures of even the smallest State may affect some registrants in any of the other 49 states.

All this is one reason why I favor uniform examinations. Aside from my feeling that it is absurd for 54 boards (assuming all boards will eventually require written examinations) to prepare 54 examinations to accomplish the same purpose, I feel that if this step can be taken, greater uniformity

will come about in many other areas at a much earlier date. In many cases, the trouble is not with the laws, but with the thinking of board members.

Changing Times

No one will deny that the social and professional activities of each and every one of us are undergoing a rapid change. Sometimes I feel that our thinking, the thinking of the 54 boards making up our Council, is not keeping pace but what we should do about it is in no way certain. Education is becoming much more scientific than formerly. As long as we adhere to the principle that four years are sufficient to educate a prospective engineer to the first academic degree, the young graduate will be deficient in applied science and engineering practice. Is this deficiency in the best interest of the public whose safety and well being we are pledged to protect?

In professional examinations, I have noted a few problems which many recent four-year graduates are able to solve but which would not have been studied until the graduate level only a few years ago. Such problems can usually be avoided since the examinee has a fairly wide choice; however, we must ask ourselves whether a knowledge in advanced areas of technology should not be a qualification for registration in the not too distant future.

Another area of concern is that of specialization. Some state laws recognize a large number of special fields. The argument here is that a man should be examined in the area of his experience. Carried to the extreme, the applicant being examined is the only person who could write a suitable examination. Since examinations must be relatively simple, is there not a common core of knowledge which every engineer should possess? I believe that there is.

Probably in the future, scientists or people whose background is largely in a scientific area, must be given more consideration by the engineering profession; and so I could go on and on, but I must stop. These are areas of study by the Committee on Qualifications, the EIT Committee, the Committee on Uniform Examinations, the Committee on Education and others. I am sure they will face these problems boldly and successfully. There is much work to be done.

Acknowledgments

I would judge from my impression of the three zone meetings I attended and from the reports of the Directors in years past, that more than half of our Council members are attending zone meetings. This is an excellent record and I hope that as many or more board members will continue to attend zone meetings in the future. I must take this opportunity to express my appreciation of the work the directors do in arranging these meetings and of the work the host board and State Society does in providing entertainment and accommodations.

I am mindful of what the Hawaii Board and the Hawaiian Society have done for this meeting and while they, I trust, will receive due thanks later, I want to take this opportunity to express my own appreciation of their unlimited efforts to take good care of us while we are here.

To the committees, both members and chairmen, go my thanks and my sympathy. To spend hours without number on a report and then have this group chew it to shreds is discouraging to say the least. Again and again this happens and again and again the committees come back for more punishment. Thanks again for your work this year.

President elect Spann has offered me and the Council his help at every opportunity. I haven't used him much but we have worked out some committees together and if the judgment he has used in selecting personnel is as good as I think it is, you will have an unsurpassed roster of committees next year. He will be a fine President. Thanks Bill for all you have done this year.

A visit to the Secretary's office gives one some idea of the amount of work being handled by Secretary Sams and Mrs. Cato in a very limited space. In any organization, records accumulate at a rapid rate and storing them in proper order becomes very expensive spacewise. Microfilming these records is one of the tasks which our Secretary's office has been carrying on for some time and is now nearing completion. Routine work is voluminous. I herewith acknowledge the faithful service being rendered and say "thank you Jim and Mrs. Cato," for keeping me straight during the past year.

President's Report—1964
William M. Spann

The Forty-Third Annual meeting of the National Council of State Boards of Engineering Examiners convenes today on hallowed ground in this city of brotherly love. Here, are the sacred memories of those immortal heroes who stood before the world and proclaimed their right to be free and independent. This was an act of raw courage and an example of naked bravery against the cohorts of tyranny. Our founding fathers knew their rights, *that* the *principal duty of government* is to *protect* those rights so that its people may go about their business unmolested.

For the first time in human history a great people under the guidance of a wise and dedicated leadership had prosecuted to a successful conclusion a movement to determine that free men could govern themselves in peace and harmony, and assure each other the opportunity to enjoy the benefits of their own efforts and talents.

I believe that each of us was put on this earth for a definite purpose—for an individual helpful service in the operation and development of the civilized world, of which we are a part. Our work here gives each of us the opportunity to fulfill an assignment to pay for the gift of life. As dedicated professionals we have been given the duty by our governor to administer the laws of our state for the regulation of the practice of the engineering profession. It is a duty to prevent the unscrupulous and the incompetent from imposing on the public; to register only those able and proficient; and to maintain the recognized standards and prestige of the engineering profession. This organization stimulates, encourages and coordinates the membership of completely autonomous boards that go to make it up in reciprocal and interstate practice, and in doing so we hope that we increase the image of the engineer in the minds of the public. As professionals we are not an isolated group, but are closely related to other professions, such as architects, doctors and lawyers. We feel that the technical assistance to teaching, to industry and to governmental agencies provided by engineers is invaluable.

All branches of engineering have similar ideals in performance, but there are variable standards of procedure in each which are difficult to evaluate on an equivalent basis. Individual as well as personal ideas and convictions are also important considerations. The registration program provides a catalytic agency that should prove to be a cohesive component for united professional effort. In unity there is strength, with a full recognition and realization that the ideal itself is not possible. But, we can use the group method of establishment of policy by majority vote, and although all members are independent to act as they choose, procedures can be developed and used by those who want to do so in interstate relations. Some statistical data may be interesting, although its basis comes from an old report of the National Science Foundation, dated in 1959. From a total of 782,800 listed as Engineers, a breakdown indicated 24,100 in research and teaching; 53,500 in engineering and architectural services; 106,100 in federal state and local government; and 599,000 in industry, mining, transportation and others. The record shows that there were 272,348 persons registered in

1963, of which 73,603 were duplicated or registered in more than one state. These figures in my opinion simply indicate that registration should be recognized as a mark of quality and prestige, and the goal ahead is that all engineers in responsible positions be required to register. As it is now, only practicing engineers, or those who offer their services to the public are required by law to register. A basic policy for interstate agreements could be:

1. To cooperate the extent of full capability with other organizations in matters of mutual interest and concern.
2. To seek and to take advantage of opportunities to explore specific avenues or fields of possible cooperation.
3. To welcome proposals for cooperative activity.
4. To ask for cooperation of parties concerned in establishing fundamental requirements in examination procedures, and in the methods of grading acceptances.
5. To provide maximum enforcement efforts, and coordination of ethical practices with aid from all societies and groups interested in engineering practices.
6. Recognition must be provided in meeting handicaps and restrictions of the registration laws concerned.

Constant and rapid changes in all stages of professional engineering activities establish complex problems in meeting the challenges to give fair and proper qualifying tests for determination of competence and ability. The demands for qualified engineers, scientists and technicians are constantly increasing. Many jobs are of a highly specialized variety, which increases the difficulty in examination procedures.

Educational proficiency and the evaluation of practical experience presents a complex problem in equivalent acceptability. One problem seems to be not the experience itself as listed in the application, but how that experience was applied in practice. President Butler of Columbia University once aptly said—"the world is made up of three groups of people; the first group, a very small one—*who make things happen*; a somewhat larger group—*who watch things happen*; and the great multitude—*who don't know what happens*."

The effort to evaluate the procedures within the scope of the activities of the council is a continuing process. Special attention is given to matters of importance that affect the processes of registration within the member boards, which frequently brings up repeat considerations in discussions, but at the same time we are moving forward progressively and slowly. Our capabilities of development as a council must be built around the abilities of our membership to understand the other fellow's problems objectively, not with compassion. One of the expanded capabilities we sorely need is flexibility in adjustments, the key to development of controlled responses and adaptation of our efforts to improve our position to meet the advances of this progressive civilization. We must be able to respond on a sound basis, within legal limitations, to retain initiative, and the settlement of issues that confront the very existence and survival of professional engineering. If this council has no other objective, its possibilities in coordinated effort, to form a united national front, is well worthwhile. We are trying to anticipate progress in technology against a background of political reality.

Our functional subject is that of *registration*, but the ramifications and connected and associated interests, permit us a lot of latitude in matters under discussion.

A summary of some of the activities of the council can be illustrated by a brief analysis of the major work of the committees, which are the life blood of the organization.

Standing Committee Activities

The primary functions of the national council are conducted through its board of directors, in conjunction with its committees and its executive secretary, as outlined in the constitution and bylaws. The success and/or failure of the work of the council is dependent on the activity and the research and development work in the committees, followed by positive action by the council. All committee work is closely inter-related. There are two types of committees—standing and special, the members of which are appointed by the president. They report to the council at annual meetings for considered action. The work of these dedicated men has been outstanding as indicated by the progress made by the profession in registration matters. Basic information for committee study must come from you, the individual member boards, so please answer questionnaires promptly.

1. **The Uniform Laws and Procedures Committee** under Morgan Allen, works with all committees on the improvements to existing laws and practices, and the strengthening of provisions for administration and enforcement. Enforcement practices need a lot of attention, based on provisions contained in local laws. Wisconsin has been unusually successful in some of these matters and can be a guide in formulating a policy statement, always remembering that "law was made for man and not man for law; that the government is the servant of the people, and not their master." This committee has done an excellent job in the revision of the *synopsis*, on registration requirements in each state.

2. **The Committee on Constitution and Bylaws**, under Ed Whitehead, is keeping in touch with changes necessary for the proper operation of the council. These revisions are submitted to the council for consideration.

3. **The Committee on Qualifying Experience**, under Clarence Evans, has had a busy season, reviewing the practices of today, to try to adjust antiquated methods of modern needs. His work concerns a candid evaluation of education and experience, as well as studies as to what is an adequate examination, to test the proficiency and ability of a candidate for registration. We have tied in this committee with inter-society relations, and have made contact with the major societies in an effort to secure aid in the determination of proper procedures to meet the needs. We appreciate the interest shown in our contacts. The complexity of qualifying requirements in engineering and industry may be illustrated by data shown in the following table:

Teaching uses	3.1% of the Engineers
Consulting Engineers use	6.9% of the Engineers
Government uses	13.6% of the Engineers
Industry and manufacturing use	56.5% of the Engineers
All others use	13.1% of the Engineers
	100.0%

In my opinion this shows a necessity for a controlled basic engineering educational program.

4. **The Committee on National Bureau of Engineering Registration**, under Moses Cox has done an outstanding job as a fact finding and certifying agency for the issuing of NBER certificates.

5. **The EIT Committee** under Herman Moench, with the help of George Branigan, has made real progress in the establishment of the EIT program. The northeast and the southern zones are to be commended for the success of common EIT examinations. They are in my opinion a marked success.

6. **The ECPD Committee**, under Ben Bogard assisted by Art Weber, has done a remarkable job in the handling of a difficult situation. ECPD has done a realistic job in handling its accreditation procedures, but has sidestepped NCSBEE on its inspection committees, and we disagree in its apparent self-perpetuating practices on A & E committee assignments. Since NCSBEE has a vital interest in the accreditation program, it was felt that some action was necessary. We have met with the executive committee of ECPD, and suggested improvements in relations, approved by the board of directors at Denver, were submitted to ECPD for consideration. It is hoped that some remedial action will be forthcoming soon.

7. **The Committee on Finances**, under Grant Borg, is doing an excellent job in handling our budget to the maximum economical limits.

8. Bill Kelley and his **Committee on Land Surveying** are trying to set up improvements in the model law on surveying, and with it a companion *syllabus*. It is a difficult task because of the variations in ideas and the laws of the several states.

9. **The Committee on State Board Secretaries**, under Bill Rowan, always has an excellent agenda at its meetings, and its helpful suggestions are making administrative matters between boards at a state level, more effective and exacting.

10. **The Committee on Public Relations** under Allen Janssen, has one of the most necessary duties in trying to increase the image of the professional man in the eyes of the public. It is a real selling job, and we are not doing so good. It is encouraging to note that some governmental agencies have shown an interest in registration. Plato is quoted as saying "The penalty that wise men suffer from indifference to public affairs, is to be ruled by unwise men."

11. **The Committee on Model Law Revision**, under Bob Rhinehart has handled well a very frustrating job. Effort is being made to have a flexible law that will be adjustable to all conditions, yet be strong enough to comply with the exacting needs of the profession. I am hopeful that the council can agree on definite conclusions at this meeting so that a printed version can be available for general use. Changes should not be made without serious thought and considered analysis to avoid constant revision made to meet individual ideas.

12. **The NCSBEE-CCPE Joint Committee** under Newell Freeman and O. B. Curtis aided by Leo Nadeau of Canada is studying a plan to make the committee a truly international one. Consideration is given to foreign practices on registration and regulations of the Engineering profession as a matter of information to our Engineers who practice in foreign lands. We invite engineer representatives to meet with us so that we can become better acquainted.

13 and 14. **The Awards and Nominating Committees**, have served the council and we thank them for a job well done.

Special Committee Activities

We have three special committees that will submit reports for your consideration. All are important to the future of the council, and each one should warrant your full and careful consideration.

1. **The Committee on National Examinations** under Arnold Henny has studied the entire matter for the past two years. His report with a plan for implementation will be forthcoming, and requires your consideration.

2. **The Committee on Optimum Requirements for Educational Requirements for Registration**, under Carroll Beeson, has reviewed the field and studied the field. Due to the complexity of the situation and the condition of the changes in curricula in the several colleges

more time will be needed to arrive at an answer. What minimum education should a person have to permit registration? The study by the ASEE on "Goals for Engineering Education" will be of value in our study. It is my feeling also that this study should well be tied in with a study on practical experience requirements and how to evaluate the data as presented to the examiner.

3. **The AD-HOC Committee to Study Consolidation of Registration Licensing Boards in the States**, under Steve Crouse, has done a full time job, and an excellent one, in collecting data for your information and action.

Acknowledgements

My sincere thanks go to each of you for the job you have done. I appreciate the opportunity that you have given me to be your administrative officer the past year. It has been a pleasant duty. My thanks go to all of you, but may I say thank you to a few who have gone beyond the call of duty to answer my call for help—Wes Evans, Steve Crouse, Bruce Williams, O. B. Curtis, Ben Bogard, Jack Beretta, Arnold Henny and Jim Sams.

Zone Activities prove more interesting each year. It was my privilege to attend the meetings of all zones this year, all of which were outstanding conferences, well attended. A lot of interesting subjects were discussed covering matters of concern to those present. It may be possible for future consideration, that matters of importance be discussed and acted upon by all zones before coming to the council for final action. It would allow more complete consideration and analysis of mutual problems, before final action is taken.

Engineering is a great profession. It is fascinating to watch the growth of the civilized world, much credit for the orderly performance, of which, can be credited to the engineer—it would be difficult to imagine how society would get along without him. He works in a world of his own—seeking no aggrandizement—is just satisfied doing his job—it seemingly speaks for itself. But in my opinion, we need a program of public relations—not in an individual way but as a profession as a whole.

Architects. There has been some dissatisfaction in the ranks of some of our architectural associates—that the engineer is usurping some of his prerogatives. It was my privilege to attend the annual meeting of NCARB in St. Louis. Their aims and objectives are somewhat similar to ours. In the matter of overlapping practice the use of the word "incidental" seems to be questioned. The suggestion was made that a joint or liaison committee between NCARB and NCSBEE be formed, to study the differences.

The Secretary's Office

A few days in November were spent at the headquarters office in Clemson. The efficiency and operation of the office is outstanding. We are indeed fortunate in having a capable executive secretary in Jim Sams, and an excellent staff in the office under Mrs. Julia Cato. It is amazing to me how such a small office force can handle the volume of work imposed on it so expeditiously and effectively, on such an economical basis. My thanks go to Dr. Sams and Mrs. Cato for their cooperation. Our thanks also go to the college officials at Clemson for their courtesies in permitting use of their facilities for the last four years at a very reasonable rental.

We have received a certified report on examination of accounts of the council from C.P.A. covering the council's financial activities during the past year. This report is included in the report of the executive secretary.

Conclusions

We have seen registration grow from a small beginning to be a successful unit in the field of professional engineering. It should be of vital interest to all engineers, because in its functional operations, it has a restrictive regulation on those who practice engineering. Some states have a limitation on the time a board member may serve, so that we have a constant turnover in council membership. This has the effect of bringing in new ideas, which serve to improve procedures in operation. We need a study on registration in industry, which could add to numbers registered. This will require full cooperation of industry and the founder societies. The entire registration movement will be strengthened, if we can show its value, and if we can add industry and governmental agencies to the program. One of our weaknesses in administration is a lack and shortage in communications, with our own people as well as with the public. We have tried to keep you informed as to what is happening, and what your headquarters has been doing, so that you will be in a position to judge the value of recommendations presented to you in reports and permit you to take intelligent action on accepting or rejecting the recommended action.

May I comment on a few opinions of my own—

1. The existing *constitution and by-laws* should be rewritten in its entirety, to meet advanced procedures, be consistent and authorize *positive activities* for *positive operating processes*.

2. **Policy statements** are needed on all activities, to turn council deliberations into positive action. The adoption of policy statements by a majority vote would be beneficial in eliminating continual wrangling on controversial subjects year after year without agreement. Such statements could cover such items as:—

(A) Procedure in cases of non-residents seeking original registration.

(B) Comity and other than written examination acceptances.

(C) Examination criteria—what makes up a basic test?

(D) Grading procedures—raw score to final grade used.

(E) EIT practices—Education and experience requirements. Such policy statements could be limited only to that part of registration laws referring to interstate registration.

3. **Zone** activities are very important. A study of all council procedures is suggested, to tie the structures together more closely, and to improve the operating procedures of the whole council.

4. **Make a complete study of the funding processes** of the council, with the help of all state boards, to see if a more satisfactory fee system can be found.

5. **Emphasize necessity for full cooperation of all states**, closer relations of societies and develop international relations to cover the activities of foreign professional engineers, especially on registration requirements.

Final

That is my story—the faith and integrity of the engineer will take him through this revolution of the ages; his education will develop as the future demands; he will broaden his thinking to include social and economic problems, created by his works and the other professions of the new age; and the very nature of his work places him in a position to make decisions and recommendations regarding sequences of action, tolerances of performance, and quality and quantity of production. It's a great world. May your future be a rewarding one.

President's Report—1965
J. W. Beretta

As we progress with the agenda for this, the Forty-Fourth Annual Meeting of the NCSBEE, the time has arrived for me to present my report as President of your Council for the past year. In the preparation of this report I made many false starts and have filled wastebaskets with crumpled sheets of paper containing these discarded approaches to my report. As I crumpled the last sheet of paper, I returned to the basic thought that actually I am not reporting on my own activities, but am reporting on the activities of an untiring, dedicated, and hard-working group of council members as individuals, as chairmen and members of committees, as directors of Zones, and as officers of the National Council; and, last but not least, as dedicated public servants.

You have received from our Executive Secretary a printed copy of the reports for the Forty-Fourth Annual Meeting of the NCSBEE. These are all well written, full and complete reports of all of our various committees, directors and officers, which tell in great detail the important work carried on by the Council during the past year, and chronicle its achievements, failures, successes, and frustrations. When I pondered on the completeness of these reports and realized that my own report would merely be a repetition and summary of the work done by others, I came to the conclusion that in the interest of brevity nothing could be gained in repeating. Accordingly, I refer you to the printed reports, and to verbal discussions on the floor of our meetings, to give you my complete report as President of your Council for the past year.

I do, however, want to take advantage of my position on the rostrum to tell you how much I have enjoyed my year as your president. It has been most inspiring to me to have the privilege of working with such a fine group of dedicated, intelligent, and capable men. I will long treasure the memories of my year as president, and of the fine associations and friendships that have come to me as a member and officer of the Council. During my presidency I have participated in all of the Zone Meetings and many other professional meetings, as well as letter contacts with a large segment of the membership of the Council and other organizations. I have been afforded the opportunity of making some periodic progress reports of my activities through the medium of the *Registration Bulletin*.

One of the greatest sources of inspiration to me has been the fine support received from all individuals whom I have called on to perform laborious tasks on behalf of the Council. At no time have I been disappointed, and I feel that everyone in the Council has at all times given their best to the furtherance of our work and the further progress of registration of professional engineers. If I were to make individual appreciative acknowledgments, I would end up having to name practically every member of the Council; so I ask again, in the interest of brevity, that the Council membership, one and all, accept my heartfelt appreciation for the honor you have bestowed upon me, for the active support given to me, and for the privilege of serving as your president to carry out your wishes, and to implement your mandates.

I am now joining a distinguished list of notable past-presidents of the Council. The history of each year has shown continued progress in the interest of the basic concepts of engineer registration laws,—namely, the curbing of engineering malpractice in the fostering of public health, safety and welfare. Our programs of progress have always been constructive and have shown a most favorable evolution toward our goals of the future. I know that you will continue to have a leadership that will carry on these great traditions. I only hope that in my own small way I have been able to add my own bit of constructive progress toward these ends. Our programs

for the future point to a well laid out course of action, and in the further interest of brevity I will not relist our goals for the future, which each of us already knows so well.

I relinquish my post as your President with sincere best wishes to my distinguished successor for the coming year, and the chain of successors of the future.

President's Report—1966
Leo W. Ruth, Jr.

It hardly seems possible that one year ago at NCSBEE's 44th Annual Meeting, I assumed the position as President of this Council. No one, however, whether he be president of the United States or president of NCSBEE, can stop or slow the inevitable passage of time and thus, August 1966 has arrived.

Council presidents before me have mentioned, and I repeat, the basic and most important work of the Council is performed by the various committees with the assistance of our staff members. The Committee reports which you will hear in the next several days represent the culmination of many man-hours of work;—unfortunately in some instances by the committee chairmen only, but in most instances by the majority of the committee members. The voluntary assistance given by these people represents the effective and inspiring altruistic spirit of the Council. My sincere thanks to the committee chairmen and their assistants.

Incidentally, the selection of these chairmen and committee members is perhaps the most difficult job which a president-elect encounters. In fact, he no sooner assumes this title at the Annual Meeting when Jim Sams descends upon him with a large and detailed, but most helpful, chart with the suggestion "you better get started on those committee appointments." Article IV of the Bylaws stipulates the number of members on a committee and how they shall be selected—two from each Zone with a ninth man as chairman and the suggestion that the chairmanship be rotated among the Zones. Unless the president-elect during the two years prior to his appointment was a peripatetic individual with the opportunity of attending all the Zone meetings, his knowledge of the various Board members, their inclinations, specialties, etc., is extremely limited. In many instances, the "square plug" has been thrust into the "round hole" with a consequent loss of efficiency and effectiveness. Perhaps there are other methods of committee election that we should review. As yet none have been officially suggested and I am mentioning this in the hope that it might provoke some helpful thoughts.

One of the great experiences and satisfactions afforded the president of the Council is the opportunity to attend the Zone meetings as well as meetings of other technical and professional organizations. During this past year I did have the pleasure of meeting many Board members at the four different Zone meetings as well as attending upon invitation the Annual Meeting of ASME, AIIE, AICE, National Council of Architectural Registration Boards, Kansas Engineering Society, and ECPD's Annual Meeting in Clearwater, Florida last October.

In connection with the ECPD meeting I also was afforded the opportunity to audit the activities of its Engineering Education Accreditation Committee. This was a most informative experience. As you are aware, one of our goals during the past year was an effort to increase the awareness in ECPD of NCSBEE's objectives and the availability of its members to assist on accreditation-visitation teams. As a corollary effort we were hoping that the inspection teams would reflect a balance of professional engineering members representing both education and industry.

When discussing the participation of State Board members or other Professional Engineers who are not educators, the Accreditation-Visitation Committee chairman has pointed out that those

chosen from industry or private practice invariably cancel out at the last minute. This forces the committee chairman to frantically seek someone who is available, usually an engineering faculty member who has previously served. Yes,—being a member of an inspection team is an imposition, both on you and the organization or firm you represent, but it is well worth the effort—and in this decade where we are so concerned about the lack of a professional atmosphere in many of our engineering schools, there is no better opportunity to have a direct contact with all levels of the University than through this inspection team.

As of this date, we are aware of six NCSBEE members who this year were selected for the first time to participate, and actually did participate, in accreditation visits. Recognizing the fact that none had been chosen before, this is a fantastic increase. It is sincerely hoped that this recognition of NCSBEE's interest and concern about the accreditation procedures will continue.

Interestingly enough, in the same general area of engineering education NCSBEE has been involved, perhaps unwittingly, in the preliminary recommendations of ASEE's "Goals Study" published in October of 1965. In 1964 the Council received a report from its "Committee to Determine Optimum Educational Requirements for the Professional Engineer" and in 1965 a report from its "Committee for Liaison with ASEE Goals Study." Both of these committees made substantially the same recommendations for the educational requirements of a professional engineer. Although the Council's Board of Directors feels the ASEE Goals Study misinterprets the professional degree suggestion nevertheless the basic concept would appear to have had its foundation in our Council's two committee reports. Again, this is an acknowledgement of recognition in this area. Further report on the action of the Council's Board of Directors on the Goals Study Recommendations will be contained in President-Elect Don Marlowe's review.

It was my distinct pleasure to be invited and attend the Annual Meeting of the National Council of Architectural Registration Boards. It was amazing the similarity to our items discussed by the architects. I could have closed my eyes and substituted the word "engineer" for "architect" and felt I was in typical NCSBEE Zone meeting. The complexity of examinations, uniform examinations, the publication of syllabi, reciprocity, comity, length of examinations, with or without oral interview, adoption of "rules of conduct" to be incorporated in the registration act, recognition by some States and not by others of the NCARB certificate—all of these items we have discussed many times and the same identical items were discussed by the architects. It would appear that there is a great area of mutual concern where closer cooperation would result in both registering bodies providing better service to the public primarily and secondarily to the profession. Among all engineering and architectural organizations, NCSBEE and NCARB are the only two whose members have as their primary responsibility and function the protection of the public health and safety. Of the 54 licensing boards comprising either NCSBEE or NCARB 14 presently are joint boards. From comments made to me, I have concluded that both the engineering and architectural members of these boards feel that better rapport has been developed between these two design professions and that the combination has helped the public rather than hindered the functions of either group. It is hoped and sincerely suggested that NCSBEE expand its efforts to cooperate by extending an invitation to the president and/or other designated officers of NCARB with perhaps the eventual formation of a liaison committee.

Although, undoubtedly (and I certainly hope so), there has been some progress made this past year on many of our objectives may I put forth a word of caution. At several of the Zone meetings I pointed out the number of State Government sponsored publications which have recommended the

centralization of authority and power in a single professional and/or vocational licensing administrator or czar. This would include the ultimate delegation of all examining procedures and responsibilities to a commercial testing service or a civil service or personnel department group. The Board would act on policy matters only. Such an arrangement would completely nullify the effectiveness of boards in determining an applicant's competence based on his engineering judgment and experience. The Council's executive secretary is endeavoring to collect the various publications that have been prepared by the Council of State Governments as well as those from the individual states that have been dealing with this matter. My word of caution—take advantage of whatever examination materials are made available to you through the Council office or any other source, but completely protect your right and actual selection of problems as they may be utilized in the various examinations.

May I again thank the officers of the Council, the committee members and chairmen, Jim Sams and his wonderful staff and all those who so enthusiastically worked for the council during the past year. It has been a rewarding experience for me and I sincerely hope for you, the Council members. Thank you.

Thank you very much for all the assistance you have given me this year. I will save other comments to give at the installation of officers at the banquet, and this has been longer than I anticipated in my abstract.

President's Report—1967
Donald E. Marlowe

The many actions which constitute the life of a man during his year as President of the National Council are largely determined by events outside of his own control. The appointment of committees, the attendance at meetings of participating organizations, the Council Zone meetings, the Board of Directors meetings, the special conferences, etc., have all been well chronicled by my predecessors, and really need no further elaboration from me. Not that they are unimportant—far from it—but a Council President should be able to bring to his year of service some sort of a perspective—an overview, if you will—of the movement towards engineering registration which results from his unique opportunity to discuss registration with so many facets of our scattered engineering profession.

For this reason, I thought I would use the occasion of the President's address to propose a program for the future of the National Council—not that I expect such a program to be received with wild enthusiasm, nor perhaps even that any drastic reform is necessary—but simply to record what I have learned, and hopefully to spark the imagination of some who will follow me. I have been convinced for many years that the impact of modern engineering on society is so great, and that this fact is becoming recognized so rapidly in legislatures, courts, and public information media, that the identification of one who legitimately practices our profession must ultimately be a matter of legal definition.

Our educational system is changing, with greater emphasis on graduate degrees and on continuing education. We as a Council have urged these changes. The recent NSPE convention in Hartford, Connecticut, adopted a resolution which would *require* a college education as a prerequisite to registration. Our discussions with engineers in foreign countries have indeed increased our understanding of the international concept of the engineer. From this background, I suggest a course of action which I believe would lead to greater acceptance and recognition of the concept of the Registered Professional Engineer.

As a beginning, we must adopt and spread the philosophy that only a person with the education and experience of the registered professional engineer can understand the complicated artifacts of today's world to such a degree that he can produce an *optimum* solution to his client's problem. We must convince the public that the person who can only find *some* solution to an engineering problem is no more an engineer than is the medical corpsman a doctor. This will be difficult, but the education of the public to expect an *optimum* solution is fundamental to future progress. Only a public which has realized that first class engineering is for the public good, will grant us the professional independence which is necessary to stem the tide of additional governmental standards and regulations.

Next, we must develop our system of registration, probably beginning with the model law, to recognize the changes of the past decade and of the decade to come. I suggest the following program, presuming the existence of a program of national examinations.

1. Establish liaison with the Institute for Certification of Engineering Technicians and with the American Society for Engineering Education for the conduct of a formal study of the appropriate levels for the "fundamentals" examination for each group. There should be a clear distinction between ICET and NCSBEE examinations.

2. Adopt a policy of waiving the Fundamentals stage of the engineering examinations for those who have earned the M.S. or Ph.D. degree from schools where there is an appropriate ECPD accredited undergraduate or graduate degree. Assign the title "Engineer Intern" at this stage. This would be consistent with the "Goals" study, revised version.

3. Continue to require four years of experience between the Fundamentals and Professional examinations, but develop a process whereby the record of experience is certified annually by a registered engineer.

4. Study the Professional examination intensively, working towards an examination which will require the choice and justification of the optimum solution to an engineering problem. This might even lead to the "thesis" type examination or to a formal evaluation of experience similar to the C.S.C. unassembled examinations. Charge a substantial fee for this examination and let this income be devoted to research in the examination and grading process.

5. Work with NSPE and ECPD toward developing a Code of Ethics which can appropriately be incorporated into State registration laws or rules of procedure. Several states, including Florida and Michigan, have valuable experience in this.

6. Work toward the development of a requirement for participation in a system of continuing education as an essential component of maintaining an active registration. This might take the form of a "point system," or the establishment of specialization "colleges" such as are now used in some parts of the medical profession.

7. Lay greater stress on the distinction between Registration and Licensing, so that the qualified engineer who is Registered in his own state will be able to easily secure an annual License to practice in other states. This is essential to the free exchange of engineering services across state lines.

8. Work diligently to encourage the technical societies to adopt registration as one requirement for their highest grade of membership.

This is clearly a program for the future. I can foresee some years of debate on almost any one of these topics. The program is presented here because this is the most appropriate platform—there is

no other group which is so experienced and so dedicated to the advancement of the public welfare as embodied in the registration process. I hope you will consider these suggestions and pattern some of your future programs upon them. (Applause)

As I said, this is complicated, it represents a summary, perhaps, of some years of experience, certainly it does not call for any instant action, but I think as you get a chance to read it I hope some of the ideas rendered here will bring forth programs in the future.

President's Report—1968
Edwin R. Whitehead

It hardly seems possible that a whole year has passed, bringing me to the point at which I must account for a year of stewardship which has, in fact, been more of a year of education. Recalling with admiration Don Marlowe's succinct report a year ago, I shall avoid telling you in detail of the hearty cooperation and hard work of our committees, which is evident in the booklet before you. Nor shall I bore you by recounting the many duties carried out under the watchful, and very welcome guidance of our devoted Executive Secretary, "Jim" Sams.

During the past year it has been both my duty and my pleasure to attend many meetings which can be grouped into four categories: Zone Meetings of NCEE, Participating Society formal functions, special purpose society conferences, and the Joint Society Forum for officers, past officers, and officers-elect.

It is important to the work of the Council that I bring you my best efforts in assessing the state of our profession, as brought out in these very interesting sessions. In representing the Council at these various meetings, it has also been important to distinguish between the *objectives* of engineering registration laws, the *functions* of State Boards in administering current registration laws, and the *interests* of board members as professional engineers in the problem of professional identity for the engineer and its ultimate relation to the protection of the public through a model law of the future.

There is no need to dwell on the legitimate objectives of our registration laws in relation to life, health, property, and the public welfare, nor on the functions of our member boards in relation to current or proposed procedural matters. Don Marlowe has pointed out several excellent specific matters for attention. However, both as board members and as members of the profession, we need to join in greater efforts toward making the words "professional engineer" have more nearly the same meaning throughout the entire profession.

A good starting point is the definition of the engineering profession by ECPD. It is not necessary to repeat this definition, but we can recall that it gives our profession an *educational base*, and *application process*, and a *socio-economic purpose*. We can use this firm starting point to advance toward a more unified profession.

As a first step we need to enlist the cooperation of all segments of the profession in identifying common ideas and objectives or perhaps simple misunderstanding.

Only about one third of those educationally qualified to call themselves engineers have been occupationally required, or personally motivated, to become registered. Traditionally, the environmental design segment of the profession finds registration legally required, professionally valued, and an effective protection against incompetence. Product-oriented industry, generally speaking has in the past had little interest in registration as a means of recognizing the professional engineer. It may be that product liability suits will have some influence on this attitude, but the point is that industry relies on its own performance criteria for professional recognition and feels no need for, and places little value on, registration per se.

Among the more interesting developments of the past year is the trend toward mergers of the various types of business organizations through which the talent of the engineer is made available to the public. These are of several kinds which need not be detailed here. One significant development, however, is the growth of acquisitions of consulting firms by corporations to provide the entire range of products and services necessary to supply complete, functional systems on a "turn key" basis. Perhaps this trend will have an effect on the status of the registered engineer in industrial circles, but whether for good or ill remains to be determined.

I believe that we can discern a sound structure upon which future professional recognition can be based:

(l)—**ASEE** as the product supplier, or the educational base

(2)—**ECPD** as the quality control department

(3)—**The discipline-oriented technical societies** that provide the continuing technical development of the engineer through practice, research, publication, and educational feedback to ASEE and ECPD.

(4)—**The socio-economic purpose** of our profession, as the benefit of mankind, is the unifying thread running through all organizations in various patterns. It is in this area that the profession should seek to strengthen the pattern and provide the individual engineers with a sense of accomplishment which arises from public appreciation of his contributions.

In his contribution to the welfare of mankind, the engineer brings his creative talents to the public in three broad but interrelated ways:

(a) Through industrial *corporations* manufacturing products, product combinations, or complete functional systems of widely variable character.

(b) Through public utility corporations furnishing an *end-service* such as communication, power, transportation, water and sanitation systems.

(c) **As engineering design services** combining products, materials, and public services in harmonious relation to the natural environment to meet the physical, social, cultural and spiritual needs of society.

The exercise of this creative talent by the engineer, as in all human endeavors, is subject to evaluation, not only by the employer or client, but by his peers, so that he is at some point recognized as having achieved "professional status." It is, or should be, axiomatic that the interests of the employer, the client, the general public, and the engineer himself are served when he achieves professional status.

Generally speaking, in the past, the engineer in corporate employment has been evaluated by his superiors and associates and the corporation has assumed responsibility for the adequacy of products and services flowing from his work. On the other hand, the engineer furnishing design services to the public has been evaluated through the legal processes with which we as board members are familiar.

The scope and complexity of modern engineering projects and systems is rapidly approaching a state in which the distinctions as to kinds of engineering practice will become increasingly invalid so that we in NCEE, with the help of industry and the technical societies, must seek a more nearly common approach in the recognition process. I am confident that together we do have the resources to accomplish anything we jointly feel necessary. NCEE has made real progress in the examination process, and with the active help of ASCE, ECPD, and perhaps professional testing services, even more effective procedures can be developed.

NCEE should concentrate its professional level evaluation processes along general lines, stressing concepts common to most or all engineering specializations, including principles of professional conduct.

Some mechanization, as yet undetermined, should be sought wherein the discipline-oriented technical societies could assist us in the identification of areas of professional competence.

It should become possible, in the distant future perhaps, to provide prompt verification of a fully recognized original registration together with certification of technical areas of competence so that the engineer can move confidently to his work by a simple request suitably directed to NCEE and the legal jurisdiction applicable.

In closing let me stress that I know of none more devoted to the ideal of public service than those who serve on our boards of engineering registration. Let us look forward toward even greater service by strengthening the cohesive trends in our profession as we press forward toward improvements in our special functions through the work of our Council.

Thank you for my year of education!

President's Report—1969
George F. Branigan

The real significant work of the National Council of Engineering Examiners is done by the standing and ad hoc committees of the Council which the President appoints, usually with the help and guidance of the Executive Secretary, the Past President and the President Elect. At any rate, your President asked for and received complete cooperation of his fellow officers in helping him to choose personnel for the committees which functioned under his leadership during the past year. The REPORTS for this Forty-eighth Annual Meeting speak for themselves and the Committees that prepared them.

Serving as your President has been a broadening experience involving considerable travel. Attendance at Zone meetings in New York, Cincinnati, Biloxi and Portland, Oregon; Technical Society meetings in New York, Houston and Chicago; NSPE meetings at Las Vegas and Kansas City; ECPD meetings in New Orleans and New York; NCARB, Joint Society Forum, and Future Recognition of Professional Engineers Committee meetings in Chicago, proved interesting and educational to me. Also, I discussed NCEE activities with the Arkansas Association of Land Surveyors in Little Rock, and the Oklahoma Society of Professional Engineers in Oklahoma City. I only hope that I served as an adequate ambassador for the National Council during my year as your President. I gained much while serving you.

The "explosion of knowledge" that has occurred in the world since World War II has been so tremendous that it causes one to reflect on the changes that are occurring around us. How many of us who received our engineering education prior to 1950 studied such subjects as: Information Theory; Feedback Control; Modern Atomic and Nuclear Physics; Computer Technology; Computer-aided Design; Solid State Physics; Plasma Physics; Probability Theory in Decision Making; Bio-Medical Engineering; and Marine and Outer Space Exploration? How many of us thought that only sixty-six years would elapse between the first aerial exploits of the Wright Brothers and Neil Armstrong's and Buzz Aldrin's walking on the moon?

Some groups in our society have pointed out that licensing, by its establishment of standards and minimum requirements may have imposed some restrictive influence on education by encouraging rigidity and fixed norms, which are incompatible with experimentation and flexibility. These same

charges have been made against ECPD accreditation procedures. We should probably never be satisfied with maintaining the status quo of the engineering profession.

Licensing of registered professional engineers should never become a limiting influence on the practice of engineering by those unlicensed engineers who are truly competent. The environment in which we live today—and that in which we will live in the years to come—should bring about changes in our licensing procedures that will keep pace with our technological advances.

The increase in technical knowledge has resulted in a proliferation of engineering curricula, despite some opposition in accrediting organizations. This opposition developed principally because of the difficulty of recruiting inspectors for the accreditation of curricula that did not fit the pattern of existing technical societies such as ASCE, ASME, IEEE, etc. However, despite some opposition of further proliferation in engineering curricula, the latest ECPD list of accredited curricula includes 23 separate categories, with only 11 sponsoring technical societies from which to choose inspectors.

The same problem that exists in accreditation of curricula applies to the licensing and registration of professional engineers. Many State Board procedures do not provide for the licensing and registration of many of the newer branches of engineering. In some cases, this situation results from outmoded thinking that we should restrict ourselves to those branches of engineering that established the Founder Societies. This philosophy still existed among some members of the Education and Accreditation Committee of ECPD when I became a member in 1955. The Additional Criteria that evolved from the Grinter Report defined the essential characteristics of an engineering curriculum—and even the eventual accreditation of a curriculum in Welding Engineering resulted from this newer viewpoint.

Much progress has been made in licensing and registration procedures since I became a member of the Arkansas Board in 1951. Some question whether we have progressed as rapidly as our expanding technological development has dictated. They cite the 248,000 registered professional engineers in the United States as evidence that registration has not been as attractive as it should have been, when there are 700,000 to a million who have engineering degrees and are eligible to seek registration.

W. Morgan Allen of Oregon, who succeeds me as President of NCEE at the end of this meeting, convened a group of engineering industrial leaders in Chicago in April of 1968. These men explored many facets of engineering registration, trying to put their fingers on the reasons why less than 40 percent of engineers in industry see fit to become registered professional engineers. This exploratory meeting led to the appointment of a committee to engage in a broad study of "The Future of the Professional Recognition of Engineers." The committee appointees were chosen from heavy industry, light industry, public utilities, environmental engineering, aerospace industry, education, consulting, and the engineering societies. Few members are on State Boards of Engineering Examiners, although an NCEE member, Rex A. Tynes of the Nevada Board, very ably served as its chairman.

This committee has made an Interim Report and a Panel Discussion will be presented at a later business session of these meetings. Plans have already been made by my successor to continue the committee for another year, with the possible addition of some significant segments of industry not represented at the present time. I wish to commend the committee members who functioned very effectively in two assembled meetings in Chicago during the past year, under the capable leadership of Rex Tynes.

I would not wish to lead you to believe that the National Council has marked time while the Ad Hoc Committee mentioned above attempted to help us chart our course for the future. As I

stated earlier, the standing committees made significant contributions—as you will learn when they present their reports. However, I think I would be remiss if I did not call your special attention to the work of the Uniform Examinations Committee. In addition to providing a new "Syllabus for Written Examinations" and "Standards for Graders," the Committee, with the able assistance of Secretary Sams, has entered into a contract with Educational Testing Service at Princeton to prepare and administer an objective type, multiple-choice, four-hour Examination in Fundamentals. The other four-hour Examination in Fundamentals will be the usual subjective type problem-solving examination over the eight areas presently in use. An opportunity to judge the effectiveness of the two types of examinations will be presented. They will be of the open-book type as presently used, though use of reference books on the objective test will be of questionable value due to the time limitation.

The advantage of the objective type of examination is the increased scope of coverage. If we find it acceptable to use for both half days of examinations, which the architects have found to be true, an extension to the Second-Day or Principles and Practice Examination will then be possible. The flexibility of these possibilities to register engineers as professionals, regardless of their narrow branches of practice, will be enhanced tremendously. Engineering registration procedure will truly have advanced—and the registration of an engineer in almost any discipline will be readily possible. My visits to the Zone meetings indicated unanimous approval of registration as professional engineers, rather than registration by narrow branches of engineering.

I look forward to the Final Report of the Committee on "The Future of the Professional Recognition of Engineers" next year. Their dedication to the task they have assumed has been very encouraging. Their recommendations to this Council will be deserving of our very careful considerations. I have confidence that this Council will accept those changes that will update and build respect for the procedures which we advocate for the registration of professional engineers.

There is one matter, however, that I feel should be discussed very seriously at this meeting. I refer to the Engineering Technology curricula and the weight that should be accorded them in considering applicants for registration as professional engineers who are graduates of such curricula.

I wish to thank you for letting me serve as your President during the past year.

President's Report—1970
W. Morgan Allen

This meeting brings to a close 50 years of progress of this Council and it also brings me to the time when I must report to you and account for a year of stewardship which has been most enlightening and enjoyable. I hope that I have been a good ambassador for the Council to the many meetings and to the numerous individuals with whom I have had the opportunity of discussing mutual problems, especially since communication is so important in today's fast changing world.

I feel that this has been quite a successful year. The Council has made substantial progress on several fronts as will be borne out by committee actions to be discussed during this meeting and as covered by the full committee reports included in the gold covered booklet before you. Needless to say I have had the hearty cooperation and the outstanding help of the many committee chairmen, committee members and the officers of this Council. One does not appreciate the tremendous help and the huge amount of work that is done by our Executive Secretary and his efficient staff until you have worked with our headquarter's staff as closely as I have during the past year. To all of you I express my sincere thanks.

During this past year I have considered it both my duty and it has been my pleasure to attend all NCEE Zone meetings and to sit in on some of our Commitees' meetings to observe their workings. I have attended numerous of our Participating Societies formal functions, as well as participating in some of the special purpose society conferences such as ECPD and Joint Society Forum meeting. One of my most enjoyable meetings was with our counterparts, the Canadian Council of Professional Engineers, and in meeting with the Western Congress of Engineers of Alberta who were celebrating their 50th Anniversary at Jasper Park Lodge during the same week.

It is essential in assessing the state of our Council that the bits of wisdom, the changes that are taking place, and actions that are having their effect on the future of the engineering profession must all be considered. It is also important to distinguish between those functions and objectives which relate to our responsibilities as members of our State Examining Boards and those objectives and interests that each of us have in being a member of, and the responsibilities that we have as individuals to the engineering profession.

First I would like to cover my assessment on those items that relate directly to our Council and to each of you as a member of your State Examining Board. We are well aware of our responsibility to uphold, administer, and regulate the Practice of Engineering as it relates to the welfare of the public in safeguarding life, health, and property.

We know that the registration laws have been improved over the years in order to effect better administration and effectiveness. I raise the question, however, are they adequate in view of today's complex practice of engineering? Are they sufficient to protect the public welfare in today's society when man's total environment appears to be in grave danger? I think we must soon be taking a new look at the adequacy of our existing laws. We, as engineers, have had the technical know how but haven't we failed to fully consider the effects of our designs, machines, and systems on the ecology and on man's environment.

In the area of uniformity of standards and practices in granting engineering registration we've come a long way, but still have a long road ahead.

It is gratifying that most states have accepted the Uniform Examination on engineering fundamentals and that 1971 will see a partial change in the format of this examination to that of an objective type. From what I have seen of this type of examination I feel sure that it will be of distinct advantage in really determining whether or not an applicant has acquired the necessary knowledge and relationship of functions in engineering fundamentals to properly go about solving the problems that arise in everyday practice of engineering. I have high hopes that this form of examination can be extended further in the total examination process as soon as sufficient experience has been obtained from present trial examinations. I also predict that it will be necessary for *all* states to adopt the use of the uniform examinations in order to eliminate the problems now existing in accepting applicants by the comity route.

Our examination process on Principles and Practices in most of the more major fields of engineering specialization needs to be studied very carefully. Especially in view of the comprehensive examinations being considered before the new proposed professional degree is granted by professional schools in Engineering. Such an examination would be required of all professional degree applicants regardless of their chosen specialty field. A common examination with sufficient choice of questions in various fields, and possibly of the objective type may have merit in improving our total examination process. Again I say the time must come when all states will utilize the national uniform examinations prepared by our Uniform Examinations Committee which is composed of members from the various State Boards.

One other point on examinations for non-engineering graduates and those graduates in the allied sciences fields—I recommend that the appropriate committee or committees start very soon in preparing a series of comprehensive examinations in the common core fundamentals of engineering. Such examinations would be used to establish whether or not an applicant's engineering knowledge would be equivalent to graduation from an institution with an accredited engineering curriculum. Such a series of examinations have been very useful to the Canadian Council of Professional Engineers in determining the qualifications of non-engineering graduates.

A study now under way by the American Society for Engineering Education chaired by Dean L. E. Grinter should be a great help to our Council members in determining how to relate the two- and four-year programs in Engineering Technologies to the Engineering Program. It is expected that a preliminary report will be available this fall. Any decisions on policies by this Council should be deferred until after that time.

On the matter of registration by comity, I would like to ask you to give very serious consideration to adopting the recommendation of the Future Recognition of Professional Engineers Committee concerning this subject. I also believe that incorporating such a policy or procedure on a universal basis by all states would go far in eliminating the present chaotic situation that appears to be causing some concern to highly qualified and well-established Professional Engineers.

Now I would like to make a few comments on objectives and interests that each of you have in being an individual in the Engineering Profession.

It would be useless to repeat again the words of our past President, Dr. Edwin R. Whitehead, in his presidential address to this Council two years ago at Denver, Colorado. His thoughts and words on this subject are complete and well outlined. They are as applicable today as they were at that time. I suggest that you refresh your memory when you get back home.

In my travels this past year I can detect and actually see in some cases where other segments of the Engineering Profession have made definite progress toward helping make this a real and true profession.

Steps are under way to give our profession the education base that has been lacking these many years. There appears to be greatly improved channels of communication between all segments and societies in the profession. We need this exchange of views in order to develop a meaningful and respected profession.

I am sure that during the past year you have become more aware of what the public are now demanding in the engineering design services and their effect on the environment. The outcome of which will probably be governmental controls instead of design specifications made by the profession and adhered thereto by those members, concerns, corporations, and manufacturers involved in the socioeconomic total problem. Therefore, I appeal to you as an individual to take on a much broader view of your profession than has generally existed in the past.

The report to be presented at this meeting by the Future Recognition of Professional Engineers Committee is an attempt by many dedicated and outstanding engineers in the four segments of professional practice to try and arrive at a possible solution and plan that would bring the engineering profession together.

Let this Council get behind this proposal and see if the profession as a whole will not see the wisdom in helping to attain such a goal.

Thank you for wanting me to be your leader this past year.

President's Report—1971
Chester A. Arents

Today we bring the 51st year of the National Council of Engineering Examiners to a close. As your 49th President, you and I have introduced the Council to its 6th decade, and I feel that together we can look back on this year as one that was eventful, one that was program building, and one with great accomplishments—not because I was your President, but because this Council has been built on a foundation with deep and great strengths. Resting on top of 50 States, two Territories, one Commonwealth, one District, and one Jurisdiction, we jointly have a registration of approximately 280,000 Engineers and Land Surveyors, approaching 1/3 of a million.

With the passing of our dear friend, Dr. Jim Sams, I know our feelings are coupled with sadness as well as with a feeling of accomplishment under his able leadership as Executive Secretary along with the officers and members that served with him.

With over a decade of service to the National Council, I became your 49th President, knowing full well that the registration of professional engineers and the regulation of our State laws was the Council's chief mission in the life of our great profession as it serves each State, Commonwealth, District, Jurisdiction and Territory. In fact, I can verify the fact that practically every cent of your money is dedicated to the registration of professional engineers with a slow emergence, but an accelerated one, of regulation, which activity rests in the field of assisting our Member Boards with data and advice which can be used effectively in the enforcement of their State laws. Thus, I am asking at this meeting that the Law Enforcement Committee be made a Standing Committee of the Council…I will ask the Board of Directors to recommend this to the Constitution and Bylaws Committee for official action at our next annual meeting.

No doubt some of our members feel that I was your "eventful" President, but let me say that no man stands alone, and I have relied on the entire strength of this Council, which includes the contributions of our past Executive Secretaries, Keith Legaré and Jim Sams, our Past Presidents, many of whom are here today, our past Directors, our present Board of Directors, Llew Schofield of the Northeast Zone, Harry Myers of the Southern Zone, Cliff Horn of the Central Zone and Orland Mayer of the Western Zone; our President-Elect, Tony Bavone, our immediate past President, Morgan Allen, and the assistant to the Executive Secretary, Julia Cato and the entire National office staff and every Council member. Mel Manning and his Uniform Examinations Committee and Dave Fields and his National Certification Committee took on added responsibilities in assisting the National Office for which all of us are truly grateful. Each Zone has its own characteristics, but each in its turn makes tremendous contributions to the National Council and it was my pleasure and privilege, along with that of President-Elect Tony Bavone to attend each Zone meeting and participate in their programs.

Lest you feel that I have failed to mention our Committees, I hasten to say that the actual work of the National Council is performed within the Committee structure, tied to the Board of Directors and the National office. We are a Council of strong Committees, and this strength of the Council is growing. It is my hope that my administration has set in motion greater participation and greater support to our Committee structure with all of their activities, because this is the backbone of our whole organization.

Now let me make a few observations about our profession and cover the highlights as I see them of the National Council during this past year.

It is my feeling that the engineering profession in this present, economic recessionary period is solidifying its gains and making strong strides forward in its unification. Here's how I see it: We

engineering educators who are dispersed throughout the entire organizational complex of the profession but concentrated in the American Society for Engineering Education are giving soul-searching studies to the education of professional engineers along with the education of the allied professional technicians. The perplexing question of minimal educational standards for entering our profession is being considered as well as how the technician fits into the educational structure of our many colleges and universities. This culminates in accreditation standards which are developed by the Engineers Council for Professional Development (ECPD) with its Participating and Affiliate bodies. Here we find concentrated activities at all levels, from engineering technology through the professional degree level, including the development of accreditation criteria of advanced professional programs beyond the standard of the well-known four-year Baccalaureate degree. The result of all of this will eventually affect the standard of entry into the engineering profession and the registration of Professional Engineers and Land Surveyors.

Another major thrust and unifying force in the profession is that of the National Society of Professional Engineers, whose efforts are devoted primarily to the well-being and professional interests of the Engineer. Their efforts cover the social, ethical, economic and professional aspects of engineering. Undergirding all of this, are our great technical societies and other professional engineering organizations.

The success of any of us reflects fundamental strengths to the others.

As you know, the National Council has assumed greater leadership by expanding its services to all of our Member Boards in the registration of professional engineers and is, I feel, rapidly expanding this service into the registration of Land Surveyors.

Let me be more specific. The passing of Dr. Sams caused me as your President to assume the responsibilities of both the Executive Secretaryship and the Presidency for a period of time. Thus with my Assistant, Julia Cato, we, with the backing of the Directors, operated the National office. This caused me, President-Elect Bavone, along with the Board, to study the whole structure of the National office and its budgetary responsibilities, and it also made us realize the tremendous workload that had been carried by Dr. Sams and the upcoming emergency situation that we faced in our National office in handling the expanded Uniform Examination service. Our studies led us to the fact that we really were operating with three budgets with many unknowns as to their 1971 dollar levels except for our main backbone budget—what I call the regular budget—which consists of your State fees and any monies that may come in through the sale of publications. We finally came up with the concept which has now been put into formal action by our new Executive Secretary and the Board and is reflected in the Pre-Annual Meeting Publication. This is a composite budget made up of the following:

(1) The regular budget, which consists of Board fees and monies from our publications. This budget takes care of the general operation of the National office as you would normally envision it.

(2) The National Engineering Certification Budget. This budget is based upon the money paid to the National Council for National Certification and renewal of Certification by registered professional engineers desiring this service. This budget pays for secretarial time involved, the time the Executive Secretary spent on this activity, and any Committee activity involved.

(3) The largest of the three budgets, the one I spoke of at the Zone meetings in terms of the "tail wagging the dog," the Uniform Examinations Budget which covers

secretarial time, time spent by the Executive Secretary's preparation of examinations, grading examinations, Committee activities and stipends and perhaps others that are not clearly defined at this time. This is why we now see the budget far differently than we ever did in the past—a budget that is much larger and will no doubt stretch upward to the quarter of a million dollar mark as we look into our Council's decade of the 60s, or if you care to put it on a calendar basis, the decade of the 70s.

In our study of the National office, I want to compliment Tony Bavone and his Committee members, Harry Myers and Llew Schofield for carefully studying our budget structure and helping us come up with the concepts that I have just outlined for you. Tony will no doubt tell you more specifically his budget plans for the coming 1972 year.

Another activity of my administration—one that I hope will have continued positive results—is closer ties to our Committee structure. This was started by first elevating the Advisory Committee to its proper level by providing effective advisory service to the Council President and the Board of Directors. Here Jim McCarthy as Chairman helped us refine Committee Mission statements, implementing these missions and charges for each Committee in order to guide the Chairman and Committee Members in accomplishing their objectives for moving the National Council ahead in each specific Committee area. In some cases, revised Mission statements and new 1971–72 Committee charges have been prepared and are being given to Tony Bavone's Committees, who I am sure will vigorously pursue and continue their activities starting with the close of this Annual Meeting. Although I was not able to participate in the activities of our Joint International Committee with the Canadian Council of Professional Engineers, I want to recognize and personally thank my dear friend, O. B. Curtis, for carrying this load for the National Council. O. B. personally represented us by attending the Annual Meeting of the Canadian Council held in Nova Scotia this past June…continuing the June meeting, the Joint International Committee met here Tuesday evening.

I want to thank Orley O. Phillips and his Committee for the work they have done on Uniform Laws and Procedures, C. T. Wise and his Committee on Qualifications for Registration, Mel Manning and his Committee for the gigantic job they have done on uniform examinations.

Bill Moore and his Committee for the success of the State Board Secretaries Committee,

John Reutter and his Committee on Public Relations,

Morgan Allen and his Committee on Nominations,

Jim Howard and his Committee on the important work of Constitution and Bylaws,

Dave Fields and his Committee in taking full responsibility for the National Engineering Certification program and the signing of our certificates,

Les Reynolds and his Committee for the excellent job in law enforcement,

Bob Jarvis and his Committee for the fine job done in continuing the Model Law revision activities,

Charlie Coogan and his Finance Committee in helping us bridge the gap from the old budget system to the new,

Bob Millard for the fine job on Land Surveying. Here I want to state that it is my hope that we adopt a model law for Land Surveying—PRONTO—In fact, I wish we had it on the books now, and I hope that this Annual Meeting will give it to us, either jointly with the engineering law or singly, as well as a National Uniform Examination that can be used by all States.

Ed Whitehead for his timely job of nominations for awards and to members of my Committee who were very active in ECPD activities, and

Our new Committee, Liaison with the National Council of Architectural Registration Boards, headed by Les Gates.

Also, I would like to recognize Mr. William S. Kelley, Jr. of Minnesota for the help he gave to Mr. Jarvis and his Model Law Committee as they worked on the Joint Model Law for Engineers and Land Surveyors and to Bob Reckert of Iowa, Vice-Chairman of the Land Surveying Committee, for his work in preparing the Synopsis for Land Surveyors in final form for printing and sending same to NCEE office, and to develop and organize procedures for a National Uniform Examination for Land Surveyors.

I would like to have you join me for a round of applause for this whole Committee effort and the excellent job done during the past year.

I feel that all Committee reports are excellent and that they depict the strong viability of the National Council.

In closing, again I want to say that no man stands alone, so most heartily, sincerely, and affectionately—I thank all of you—our committee members, our Participating Organizations, our Board of Directors, our officers, and members of the National office staff.

President's Report—1972
Anthony L. Bavone

It is my privilege and pleasure to submit to you today a report of my stewardship during the past year as your President. This meeting concludes the 52nd year of existence of the National Council of Engineering Examiners and, as your 50th President, I like to feel that the past year has been one of accomplishment. Organizations, like people, never remain the same. As time and circumstances change, organizations must change also. This past year has brought a number of changes in our organization, and I would like to tell you about some of them.

With the death of our esteemed Executive Director, James Sams, in November of 1970, the Council had to make adjustments and changes which, together with the increased and rapidly expanding role of our many activities and functions, made us realize that our Council was built on a sound foundation. Not only had Dr. Sams left a Council which was financially sound, but he also left a Council with a legacy of service and dedication of purpose upon which the future of our organization could be built.

The accomplishments during the year may be characterized as follows:

(a) **Stabilization of the National Office in Clemson, South Carolina**

As of August 4, 1972, our Executive Director completed 17 months in office. Under his able leadership, the affairs of the NCEE headquarters are in good order.

The employment of Hugh W. Webb, as Director of Professional Services, has made it possible to keep up with the ever-expanding examination program. In his new position, Mr. Webb is providing administrative, professional and technical assistance in two important NCEE functions—examinations procedures and the National Engineer Certification Program.

Because of the increased NCEE activity and role, the Constitution and Bylaws under which we operate were reviewed by the Board. Upon advice of legal counsel, several changes have been suggested in order for the Board to properly and legally carry out the work of the Council. This will be considered at our annual meeting now convened.

Due to increase in demand for EIT and P.E. examinations and, also, the expanding role of the Council in other areas, it was decided to set up a Headquarters Facility Committee to study the space needs and desirability of maintaining the National Headquarters in Clemson, South Carolina. The committee, under the able charge of Roy Sessums of Louisiana, President Elect, has been studying the matter. Preliminary reports indicate that for the time being at least, the Clemson, South Carolina location fills the needs of our National Council insofar as location is concerned, and additional space for the examination program has been found and rented.

(b) **Increased Services in Examination and Certification Program**

The demand for the EIT and P.E. national examinations has exceeded all expectations. The number of requests has nearly doubled in three years. For the April examination, a total of some 13,000 fundamentals and 5,000 professional engineer examinations were given.

Under the able leadership of Walter Anderson, Michigan, the Uniform Examinations Committee has been working diligently to improve the examination and to increase the number of fields covered in the Principles of Practice area. Every effort has been made to provide materials, equipment, and funds in order for the committee to cope with the increasing load.

Needless to say, employment of Mr. Hugh Webb as Director of Professional Services has made it possible for more close contact and better communications between the national office and the Uniform Examinations Committee.

The National Engineers Certifications program has been reviewed. At a meeting in Atlanta, Georgia, on June 12, 1972, of the NEC Committee with Dave Fields, Oklahoma, as Chairman, it approved a plan to improve the National Council Certificate so that it will attract more applicants. The plan will be presented at the National Council meeting now convened.

(c) **Improvements in Inter-Professional Relationship**

The establishment of the "Inter-Professional Council on Registration" (ICOR) should bring about better relationship between engineers and architects. This council was formed in San Diego, California on February 10, 1972. It came about because of the efforts of the NCEE Liaison Committee with NCARB of which Leslie C. Gates of West Virginia is Chairman, to seek improvement of relations between engineers and architects on the State basis.

After several years of effort, this committee became concerned about the continued lack of cooperation and collaboration between the engineers and architects in many states. It was felt that if the top officers of NCEE and NCARB could agree on a statement of purpose, it could then set up an Inter-Professional Council, the purpose of which was to provide the leadership, the incentive, and support to the states, which in the final analysis, is the only place where the resolving of the conflicting areas of practice as they relate to engineers and architects could take place.

The members of the Council also felt that a number of states had already taken steps to improve relations between the professions of engineers and architects. Notable examples of this are the states of Florida, Mississippi, and New York. The Council further believes that it could provide the leadership to many states to adopt similar agreements between the engineer and architect registration boards.

At this Annual Meeting, NCEE members will be presented with a proposal for the formal approval and participation with NCARB in the formation of ICOR.

As a part of Inter-Professional relationship activities, your officers have attended numerous meetings of other groups for the purpose of learning more about other related

organizations and, at the same time, provide a means of telling others about NCEE. Among meetings attended by your President during the year were:

Canadian Council of Professional Engineers
Winnipeg, Canada
Consulting Engineers Council
San Francisco, California
American Institute of Industrial Engineers
Anaheim, California
National Council of Architectural Registration Boards
Seattle, Washington
National Society of Professional Engineers
Denver, Colorado

(d) **Committee Activities**

The basic work of the Council is done by committees. The activities of four committees have already been reported. These were the:

(1) Uniform Examinations Committee
(2) National Engineering Certification Committee
(3) Liaison with NCARB Committee
(4) Headquarters Facility Report Committee

I wish to thank the chairmen of the above committees for the work they have done in these very important committees.

I wish also to thank the following:

O. O. Phillips, Colorado, and T. J. McClellan, Oregon, for the work they have done in Uniform Laws and Procedures.

C. E. Grosser, Virginia, and A. M. Steffes, Minnesota, co-chairmen and their committee on Qualifications for Registration for their good work in preparing questionnaires and tabulating the results of a survey conducted during the past year.

Q. H. Gateley, Washington, and his committee of State Board Secretaries for their outstanding work.

H. J. Ochs, Jr., Colorado, and his committee on Public Information.

James A. McCarthy, Indiana, and his committee on Advisory on Council Activities for their excellent assistance to the officers in outlining problems of future concern to the Council.

Morgan Allen, Oregon, and his committee on Nominations.

A special thanks to J. L. Howard, Tennessee, and his committee on Constitution and Bylaws, for the tremendous amount of work done in preparing the Constitution and Bylaws changes and explaining them at each zone meeting.

A special thanks to R. W. Jarvis, Minnesota, and his committee on Model Law Revision, for the detailed work of considering many requests for Model Law changes and preparing a very detailed report on recommended revisions.

C. H. Coogan, Connecticut, and his Finance Committee for the fine work done on the new budget.

Sam Barton, Idaho, and his committee on Joint International with CCPE for his success in drawing up agreements between the U.S. and Canada, facilitating the exchange of registration.

C. F. Hurc, Wisconsin, and his committee on Law Enforcement for preparing model administrative adjudication procedures as a guide for member boards.

L. T. Schofield, Massachusetts, and his Awards Committee for their good work in revision of standards for use by future committees.

R. D. Reckert, Iowa, and his committee for the great amount of work in preparing a syllabus for a National Land Surveyors Examination.

Harry Simrall, Mississippi, and his committee on ECPD for his continued good work on Board of Directors of ECPD.

I wish to say that in addition to the committee members, I want to thank our Board of Directors, our officers and members of the national office staff and to Walter Edelblut, Jr., our Executive Director. All of you have been a tower of strength, and whatever success we have had in NCEE during 1971–72 has been because of your backing and support.

If we are to summarize the work of last year, I think we can say very briefly that the things we have been concerned with first were an attempt to stabilize the headquarters office in Clemson. The fact that our executive director has been with us now for a while, has enabled us to operate this office on an efficient basis.

The next step, which I think we are all aware of, is one of great importance. This was our move in securing the services of Hugh Webb as director of professional services. This is certainly a move that will make the job of our executive director and the whole examination procedure staff much easier.

We also wish to call attention to the fact that there has been a tremendous increase in the amount of activity with respect to the examinations. I dare say this has been unprecedented and, if the figures I am able to get are right, they seem to indicate we have doubled the number of participants in our examinations procedures in three years. We have also made a study of our national certificate, and this report will be presented to you at a later time. And I think that here we have another area in which the activities of the Council may be expanded.

The third area we have been involved with is the improvement of the international relationships, and chief among the activities in this area has been the organization of ICOR which, in my estimation, is probably the most important—if not the most dramatic—thing that occurred during my administration. We are immensely pleased with the tremendous impact that has occurred from this move and we feel that here we have begun to meet head-on a problem which has been of great concern to engineers and architects.

And then the fourth area I would like to briefly mention has been our concern and our effort in supporting the work of the committees of the Council. Your officers during the year felt that the work of the Council, of course, depends upon the committees, and every effort has been made to provide such assistance and leadership and support to the work of the committees. I feel this has paid off, and you, as we listen to the committee reports during the rest of the day and tomorrow, will find that there has been a tremendous amount of work done in committees. I think you then will be able to have some idea as to the importance of the committees in our organization.

I suppose that as I complete my year of stewardship I should and would like to say a few words looking into the future. You look back on a record, see something you were not able to accomplish and you like to point these things out to the incoming officer. I believe there are several things I would just like to mention. One, of course, is the matter which we are hoping to resolve at this meeting. That is to bring our Constitution and Bylaws up-to-date—a step which we believe will do much to improve the work of our National Council. Even though we have had a dramatic increase in the number of examinations, we are still concerned with the quality of the work, quality of the examinations, and we need to, in the future, direct our attention to this matter of not only improving

the quality of the examinations but determining how we can make our examinations better or more acceptable to the various Boards.

I am thinking of an effort that is being initiated to get information as to what can be done to obtain uniformity in the grading process, and not only that, but to increase the various fields which our examinations cover. I think this activity is one we need to concern ourselves very much with in the near future.

The matter of certification is one we need to consider in our National Council. This is a trend we see coming. Unless we improve our examinations, make them more attractive, more and more groups and societies will certify their own members. This is a matter which I believe should be met vigorously. Any attempt to use the certification process as a substitute for registration should be a concern of our National Council.

These are some of the things that I believe we should look into in the future. As I look back during the year, I want to say to you it has been a very thrilling year for me. I trust that as you look over the record you will say it has been a fruitful one. I know I have had a busy time. I just did some rechecking and I find that I traveled some 50,000 miles during the year and had to take 54 days leave from my work. I have tried to give a good showing.

And in conclusion, I want to say that I appreciate very much the support I have had during the year, and I want to thank all of you who have supported me. I want to say it has been a privilege to have had this year in which I could serve the National Council. Thank you very much.

President's Report—1973
Roy T. Sessums

Our adjournment tomorrow will mark the completion of the 53rd year of the National Council of Engineering Examiners. It has been my privilege to serve as your 51st President and, as we approach the end of the year, a brief review of the accomplishments seems in order.

As President, I have presided at the four Board of Directors' meetings. You have previously received reports of these meetings, with the exception of the one held here this week.

During the past year, the officers have worked diligently to support and strengthen the purpose and activities of the Council. I believe that much progress has been made in keeping the Council attuned to the needs of the engineering profession and the general public in our modern day world.

So that we might keep abreast of developments and activities in related fields, the National Council has been represented at numerous professional meetings of other organizations throughout the U.S. and Canada during the past 12 months. Although I have attended only a few of these meetings, the Council has been most ably represented by other officers and members of the Council.

Utilization of uniform examinations is continuing to increase in the area of fundamentals, as well as in the area of principles and practice. Pursuant to the requests of some state boards for NCEE to expand its professional examinations, your Board of Directors authorized the preparation of professional exams in additional disciplines of engineering. These examinations covering the additional disciplines have been prepared under direction of the Uniform Examinations Committee.

The Qualifications for Registration Committee should be commended for initiating recommended national minimum passing scores for each examination. These passing scores were established using the national mean adjusted by a percentage of the standard deviation of each exam.

If time permitted, I would like to mention by name the many committee chairmen, committee members, officers and others who have so conscientiously and capably performed their respective

duties. However, we have a very tight time schedule for this program and, in the interest of saving time, I would say only that without the exceptional performance of our committees and members thereof, the Council could not function. I wish to compliment each and every person for his performance.

Also, I would be remiss if I did not mention the fine spirit that prevails in our headquarters office and the continued outstanding performance of the personnel in that office.

You will hear reports from our committees, officers and Executive Director during this meeting which I believe will be of more pertinence than my continuing to discourse on the year's activities.

In conclusion, I would say that the Council has had a constructive year; that as a result of the efforts and conscientious support of the entire membership we have strengthened our image throughout the country; and that we are providing services to our constituent boards in accordance with our constitution and bylaws.

I appreciate very much this fine support and want to thank the entire membership for providing the opportunity for me to serve as your President. It has indeed been a privilege.

Thank you.

President's Report—1974
Orland C. Mayer

Ladies and Gentlemen: It gives me a great deal of pleasure to report to you that during the past year substantial progress has been made in furthering the aims and work of the Council. The accomplishments of the committees, under the able leadership of their chairmen, has been in my opinion, outstanding. All of the committees have completed their assignments in a most commendable manner. This you will see for yourselves as the reports are given later in the program.

The cooperation and understanding between Member Boards has gone steadily forward in all the facets of interboard activities. Comity problems are at a low ebb. Governmental reorganization and the subsequent readjustments are confronting many boards. Continuing professional development as a prerequisite for relicensing is of major interest to most all boards.

There is a definite trend among the states for fewer reappointments after the second appointment. This trend, if practiced in all states will have an effective impact upon the activities of the Council. With the present Council policy of appointing two from each zone on each committee it will become an increasingly difficult problem to utilize the potential of many members on succeeding years as chairmen and as members of other committees. The problem largely resolves itself into finding at an early date the interests and capabilities of new members. Many states have appointments made as late as May or June which results in a communication problem with the Council office.

These and other problems give cause for review of our Bylaws relative to qualifications for service of members on committees. Several states now provide for public members on the state board. With the furthering of consumerism this could well extend to many boards. The status of these members in Council activity should be studied and evaluated.

At this time I want to take the opportunity to commend the staff operations at the executive office at Seneca. Walter Edelblut, Dr. George Sutton, Hal Zorn and other members of the office have performed their routine duties in a most satisfactory manner. They have assumed the added responsibilities and increased workload necessitated by our rapidly expanding programs in a most gratifying manner.

During the year I informed you of the action of the Board of Directors relative to the cancellation of our contract with ETS and the improvement of the NCEE staff to take over the

major part of the preparation of the examinations. In this work they are and will continue to be, assisted by the Examinations Committee. At the time the cancellation was made, it was anticipated that some services, for equipment and economic reasons, would have to be contracted. Arrangements are proceeding for the contracting of this service. However, the bulk of the preparation of the examinations will be done in-house and with the assistance of the Uniform Examinations Committee.

The arrangements and preparations for the change necessitated a non-recurring expense which placed an additional financial responsibility on the Council. These expenditures should not be regarded as a current expense but as an investment which was necessary to offset the rapidly ballooning cost of the service under our former arrangements, and should be offset by a reduction in examination costs.

It has been a source of satisfaction to the Board of Directors to note the acceptance of NCEE by the other engineering organizations as the examining and licensing authority in the engineering fraternity. In the past we have been too busy with our interboard problems to realize our lack of communications with the other engineering organizations in keeping them informed on the programs and responsibilities of NCEE in the registration field.

During the past year we have endeavored to carry out those continuing programs set up by preceding administrations and to consolidate gains made by them. In addition, we have investigated and instigated new programs required by demands of the changing times.

You might well ask, what are these "new demands" and where do they originate? They originate from four sources. First, from the member state boards of NCEE; second, from various technical and professional engineering societies as representing major components of the engineering profession; third, from state legislatures; and fourth, from the public as composed of organizations interested in the products and results of engineering activities.

The suggestions of these groups are in many cases overlapping, and in some instances contradictory. Without trying to indicate the source, I will give a few examples of which action is expected from NCEE: Continuing professional education or professional development as a prerequisite for relicensing; the acceptance of peer recognition as a measure of the status of an engineer in lieu of, or as a prerequisite to, or in addition to legal registration as now recognized by the various state engineering laws; the future status of ECPD in the accreditation of engineering programs for advanced degrees in engineering; changes in the requirements for NEC Certification; the status of the graduate of a technical or technological college as an applicant for an engineering license; a basis to measure the educational and experience records of engineers from foreign nations.

Also, the problems presented by state governmental reorganization; requests for examinations in additional disciplines; the status in NCEE of public members serving on state engineering boards; the removal of the industrial exemption from state engineering laws; the responsibility for ethical and moral conduct of engineers; political contributions from engineers; certification, before or after licensing; the effect and action to be taken relative to the consumer protection movement; competitive bidding and negotiation for engineering services; relationship with other professions in overlapping fields such as architecture, land surveying, geology, landscaping, the design field and scientific developments; and many others.

This list is not complete nor is it aimed at any group in particular, but is given as an example of subjects in which someone or some organization felt NCEE had an interest.

The number of programs which can be activated by NCEE is limited by manpower, money and time. Of course the project must first be in the field of responsibility as authorized by the Council and the Member Boards. In general, any new program undertaken during the past year has been evaluated by five standards: One: Is there a need for the new program or activity? Is the need of higher priority than that of other contemplated programs? Two: What constitutes the program or activity necessary to meet the need as determined in One above? Is the program complete, concise and well planned? Three: What NCEE committee, or if necessary, what other organization should be requested to participate in or handle direct the carrying out of the plan? Four: Is now the time to activate the program—is it too early or too late to secure results? Five: What is the cost or financial obligation involved in carrying out the program? Does the cost seem reasonable in consideration of the results secured?

Summing up: Judge the project by 1—The need; 2—The program to fill the need; 3—The group to carry out the program and its ability to do so; 4—Is this the time to activate the program; and 5—Is the cost commensurate with the results. Later on in the meeting you will hear committee reports and I suggest you use the above or similar basis to analyze and determine the action to be taken by the Council.

I would like to, briefly and in general, review the work of the various committees which constitute our Council activities. These activities cover fourteen fields and each one may be worked on by one or more committees. In the Zone meetings I reported to you on these activities and later on in the meeting the committees will give a detailed report. As symbolic of these activities I used the formula:

R E^2 A C^4 T I O N S^2

The letters in this formula represent activities in the following fields:

R— Registration, activities primarily of the Qualifications for Registration Committee.

E^1—Matters pertaining to involvement in European reciprocity.

E_2—Examinations, activities primarily involved by the Uniform Examinations Committee.

A —Accreditation, pertaining to accreditation of Engineering Programs.

C^1—Continuing Professional Development, activities by several committees.

C^2—Comity, activities involving several committees.

C^3—Constitution and Bylaws, revisions and amendments, several committees.

C^4—Certification Program, activities involving several committees.

T —Technologists and Technicians, Special Ad Hoc Committee report.

I —Industrial Inclusion in Model Law vs. Exclusion in State Laws.

O —Reorganization of State Boards at state level.

N —NEC Revisions, NEC Committee.

S^1 —Survey of Law Enforcement, by Committee.

S^2 —State Boards Role in Ethics and Professional Conduct.

At the Zone Meetings you were informed that the above formula was part of an equation and that the other side was "PROGRESS." At the time of registration you received a badge on which was the word "PROGRESS." This is the keyword or theme of this meeting. At this time I would like to discuss the second half of the formula: R E^2 A C^4 T I O N S^2 = P R O G R E S S. The left hand side of the equation represents most of the activities and phases of Council work covered by committee reports and Board of Directors activities. This work, we believe, will result in progress for

the Council. But what is "Progress"? Is it merely a fanciful word? Does it mean the same to everyone? Does it mean something tangible? The dictionary gives the following definition for progress: "to develop to a higher, better or more advanced stage." Using this definition, progress defines in a finite manner the aim of committee work.

The recommendations and results of the committee work may not give the final solution, but it is a step or steps in the direction toward the solution. The report develops our knowledge, expands our thoughts on the subject to a higher or more advanced stage. We have improved our position although we may not have reached the final or ideal solution. In other words, we have as a result of the committee work made "Progress."

However, there is another connotation which can be attached to the word "Progress." Let us regard the word "P R O G R E S S" as a mathematical formula in the equation used above. We have already indicated what the letters in the left hand side represent. What do the letters in the right hand side represent?

P = Professional	R = Registration
O = Officially	G = Guarantees
R = Responsibility	E = Engineering
S = Services	S = Society

Summing up, we have the statement: Progress = Professional Registration Officially Guarantees Responsibility (of) Engineering Services (to) Society.

In conclusion, may I leave this thought with you. In order to safeguard life, health and property and to promote the public welfare, the practice of engineering in your state or other legal jurisdiction is declared to be subject to regulation in the public interest. As a member of your respective state boards you assumed a legal obligation to administer that law. The purpose of this council is to provide an organization through which your respective Boards may act and counsel together to better discharge your responsibilities in regulating the practice of engineering as it relates to the welfare of the public in safeguarding life, health and property.

It is the belief of your officers, Board of Directors, committee chairmen and committee members that during the past year we have made progress in continuing former programs and in developing new programs to achieve the purpose of the Council.

P R O G R E S S has been made toward the ideal that: Professional Registration Officially Guarantees Responsibility of Engineering Services to Society.

Thank you for the privilege of serving as your president during the past year.

President's Report—1975
Morton S. Fine

There always comes the time for the swan song of the incumbent president and this is early in the morning. We are going to have a session today, tomorrow and Thursday and I think at this time I would like to make a few very brief remarks.

Ladies and gentlemen, delegates to NCEE, honored guests and friends, the concluding address of an outgoing president may be either a long and tedious recitation of a series of events in which the president has taken part or can be a concise summary report of highlights. The accomplishments of an administration usually speak for themselves through the medium of printed reports which you can read at your leisure and which I presume that you have in your hands.

The time allotted to us at this meeting is short enough indeed and should not be cluttered up with a list of events. Rather, I will hit the more significant items briefly and will allow as much time as possible for discussion and debate of the major issues which face us.

As I call attention to more pressing, specific items, I do not intend to demean at all the work of the routine standing and ad hoc committees which have been led by interested and concerned chairmen, backed up by the usual and dedicated work of committee members who will be reporting to you from this platform in the next few days.

This past year has been a busy and challenging one, a challenging experience certainly for me as I proceeded with not only the internal affairs of the Council, but also with its interface with the other societies of the engineering profession. I believe that within the past year NCEE has established itself more firmly than ever in the engineering community as THE engineering society which speaks for registration and the society which must be involved in any registration matters. Other engineering societies, as well as non-engineering entities, seek our input in these matters.

Referring to a few of the items which have passed my desk and which have involved me in the past year, a significant and unusual item which appeared on the registration board scene was the total resignation of the Alaska Board. This action was prompted by a new disclosure and conflict of interest law and caused quite a traumatic experience for the Alaska Board. This is a trend which must be watched carefully.

During the year, I attended several meetings of a new unity-type organization called ACE—the Association for Cooperation in Engineering. This is an organization which your Board of Directors has seen fit to join. President-Elect Herman Moench recently attended the first annual meeting of ACE and, undoubtedly, will give us a preview of its operation and its potential.

The movement toward mandatory relicensing requirements seems to have subsided for the moment, subject to more recent updating that we may be made aware of from reports which come from the floor of which I am not aware. Our Uniform Laws and Procedures Committee, chaired by Chris Grosser of Virginia, has completed and will report on an extensive, two-year survey it has undertaken in the engineering community. However, this issue continues to remain, in my opinion, a sleeping giant.

A most significant and needed review of our Constitution and Bylaws was undertaken under the able chairmanship of Elbert Lewis of Colorado and will need the continued input from all member boards in the coming year. The changing role and focus of the Council, along with the shorter tenures and more rapid turnover in the personnel of member boards, as well as the continued and accelerated addition of public members to our registration boards make it mandatory that the Constitution and Bylaws reflect these new conditions and provide us a basis to accommodate to these changes and to create new possibilities and opportunities that are thereby afforded.

It is interesting to note that for the past several meetings we have seen an increased number of ladies and public members present. I don't know the number this year, but I think it is probably the highest we have seen and I am sure their numbers will continue to grow in the coming years.

Another item of new and long-range interest which has recently come to my attention is the inclusion in the 1975 rewrite of the North Carolina Engineering and Survey Act of a new board power. This section authorized and empowers the board to "use its funds to establish and conduct instructional programs for persons who are currently registered, as well as refresher courses for persons interested in obtaining adequate instruction in programs of study to qualify them for registration."

This seems to be a step toward putting the board in the continuing education and refresher course field, both of which could have major impact on member boards' operations.

At the annual meeting last year, your Board of Directors was made acutely aware that the financial affairs of the Council needed careful consideration. To that end, I appointed Ted Stivers, vice president from the Southern Zone, as the Board's liaison to the Seneca office in this area of operations.

In cooperation with Ollie Summers of Indiana, chairman of the Finance Committee, a tremendous ongoing and untiring effort was carried on during this past year and I believe the financial reports to be presented at this meeting will indicate to you the progress that has been made toward bringing the Council to a sound financial condition.

In conjunction with this, a new plan of dues structure will be presented for your consideration, which I urge you to give your most careful consideration. I am greatly indebted to Ollie and Ted, together with our executive director for their dedicated efforts in this area.

The national uniform exams have reached an all-time high in usage. But together with this increased volume and the change in the exams in-house has come the inevitable problems of accuracy, responsibility and grading. The April 1975 exam has revealed that there is much we must do to improve our procedures both in logistics, control and quality. A great effort has been expended in the past four months by all of your Board of Directors, together with Uniform Examinations Committee chairman Don Klein of Texas, as well as an ad hoc committee on the April exam, and Seneca staff to deal with the situation.

In addition, I want to report to you at this time that we are now negotiating with ETS and we think we have reached a meeting of the minds for the input of certain of their services for the November 1975 exams. Further, we are talking with them about an additional two-year continuation for their services on future exams. It would be premature at this time to talk about specifics, but suffice it to say at this time that this whole area is being reviewed with special consideration being given to its impact on budgetary constraints. Your Board of Directors will continue to keep you informed.

In conclusion, I must say that much has been done; but, much more remains to be done and under the direction of your incoming president Herman Moench, I am sure the affairs of the Council will be in good hands.

I want to thank all of you Member Boards and individuals for the privilege and opportunity you have afforded me to be of service. I want to especially thank those of you who have served on committees, for it is the work of the committees that keeps the Council moving. A special thanks goes to the Board of Directors who have served with me, for I can assure you that this has not been a one-man show.

I look forward to continued involvement in behalf of the Council to the extent that my input can be helpful to the new president.

I thank you deeply, all.

President's Report—1976
Herman A. Moench

At the time of the annual meeting in Boston in August, 1975, the National Council of Engineering Examiners was confronted by a number of serious problems. These included major personnel changes in the Seneca office, a drastic erosion of financial resources over a period of several years, and recurring difficulties in the proofreading and scoring of uniform examinations.

In addition, an unusually large number of active National Council members have died in the interim. All of us were saddened by the premature deaths of Ken Oliphant of California and Loren Anderson of Nevada. Ken, who took an active part in the last annual meeting, was secretary of the

Western Zone and Loren was deeply involved in activities of the National Council as Vice-President and Director of the Western Zone. As recently as last December, Loren appeared to be in vigorous health at the Board of Directors meeting in Atlanta. His sudden death in January was really an acute shock. Our sincere sympathy goes to his family.

On the other hand, as an item of good news, Past President Orland Mayer has accepted the Board's temporary appointment as Vice-President and Director of the Western Zone for the remainder of Loren's term, ending with this meeting. Orland has carried out his duties with vigor and dispatch, organizing and conducting the Western Zone meeting at Boise, Idaho, very successfully.

Another important item of good news was the decision by our own Past President Morton Fine to accept the office of Executive Director at the unanimous invitation of the Board of Directors. Mort has the character, ability, temperament and experience to perform outstanding service for the Council and, in the short time since he assumed his new responsibility, he has made great strides in shaping up the operation of the Seneca office. I am confident that both in the short range and in the long term outlook for the viability and significance of the National Council, Morton Fine's assumption of his new office will be of the utmost importance—a real upturn in our good fortunes. For this favorable turn of events, I am most thankful.

During the interim period, Mrs. Lorraine K. Cauthen of the Seneca office kept a steady hand at the wheel as Acting Executive Director. Her ongoing service has been of such great help to NCEE that she richly deserves our salute and our sincere thanks.

During a period when it was most difficult to determine our financial condition and even more difficult to project into the future our fiscal needs, President-Elect Ted Stivers had dedicated himself to the detailed analysis and solution of our financial problems. He and Ollie Summer, Chairman of the Finance Committee, deserve our genuine appreciation.

As the report of the Finance Committee indicates, we have apparently 'turned the corner' and are on the way back up to financial health and stability.

After more than a year of serious problems arising from the earlier decision to attempt the scoring of all uniform examinations 'in house,' the scoring of the Fundamentals Examination has been delegated back to the Educational Testing Service under a new contract. This gives us the benefit of the nationally recognized expertise of ETS in analyzing, proofreading, and scoring these important examinations. This service has been helpful, also, to Roger Brown's Uniform Examinations Committee in its diligent work of carefully compiling valid examinations.

It was the happy privilege of our principal officers to visit, during the months of March, April and May, the four zone meetings. The Southern Zone in Charleston, South Carolina, the Northeast Zone in Cherry Hill, New Jersey, the Western Zone in Boise, Idaho, and the Central Zone in Bloomington, Minnesota, each staged valuable conferences with timely presentations and vigorous discussion of current problems. All were well attended. Vice-Presidents Jim Howard, Amos Kent, Orland Mayer, and Al Samborn deserve our applause for engineering such excellent sessions.

At this annual meeting many of the most significant issues are contained in the proposed restructuring of the NCEE Constitution and Bylaws. Chairman El Lewis, together with his ad hoc committee, has prepared a series of changes which need your prompt decisions. It is hoped that these important suggestions and issues can be resolved early to facilitate the continued smooth functioning of NCEE.

A very fundamental issue of great importance to all professions is that of "The United States of America versus The Professions." Litigations already under way in Ohio and Arizona and pending in other states heighten the interest of all National Council members in the presentations by our

luncheon speakers on this topic. They are Milton F. Lunch, General Counsel of the National Society of Professional Engineers and Bruce Babbit, Attorney General of the State of Arizona.

Looking to the future, I feel confident that through the dedicated efforts of many of our members, as well as our officers, the National Council has made significant progress since last August and that it will continue to move forward as a vital force in professional registration under the able leadership of President-Elect Ted Stivers during the coming year.

President's Report—1977
T. E. Stivers

CONDITION

First, I am happy to report that this has been an active year for your Officers, your Staff, and your President. I believe that if you have reviewed the Pre-Convention Reports you will agree it has also been a good year for NCEE. Council affairs are in good condition. We have made solid progress in improving the quality and variety of services to Member Boards, reorganization of Staff, and strengthening of financial position and controls. It may be noteworthy that this progress has been accomplished at a time of increasing budget problems for all regulatory agencies. It has also been made in the face of strong political and social trends that are attacking the whole concept of professionalism, and are tending to undermine control and regulation of any personal conduct, professional or unprofessional.

GENERAL

This has been primarily a year of consolidation, and development of new staff organization and improved control procedures. As you know, we started the year with a new Constitution approved at Tucson. This required numerous immediate adjustments, such as consolidation of many committees, continuation of others on an ad hoc basis, and implementation of the new financial guidelines and reporting system. With our new Executive Director just getting settled in Seneca, and many new pressures for increased volume and quality of services at no increase in cost, our program has been one of "working like Trojans, seeking the wisdom of Solomon and all available Divine Guidance, and hoping for the best."

One of the better decisions made by your Directors at the first meeting following Tucson was the appointment of Waldemar Nelson, of Louisiana, to fill the new office of Treasurer. Waldemar has done an outstanding job as you will learn more about during our meetings.

MEETINGS

Many pros and cons have been argued as to whether, or to what extent, NCEE should involve itself in committee activities and coordinate with other groups. After three years on Board, and a year as your Chief Executive, I come down strong on the side that we must be involved, and spend the personal and Staff time, and money, required if NCEE is to remain a viable organization and serve its Member Boards effectively.

With a budget of roughly $1,000,000, and the increasing pressures to communicate among ourselves and with other engineering groups, heavy meeting schedules are becoming almost imperative. Typical dilemmas are:

Case I

1. Member Boards demand policies and support from NCEE on critical issues such as:
   —Development of Uniform Exams
   —Best use of EIT Exam

—Continued Professional Development Requirements for Relicensure
—Manufacturers Exemptions
—Law Enforcement Actions
—National Certification of Registration Records
—Registration of Technologists

2. The Directors cannot solve all these problems by "edict"—so committees must be formed.
3. Committees don't work well by mail or phone, so they need to meet, at least once, if funds are available.
4. President must draft charges to these committees, usually be present at meetings to help keep committee on track, review recommendations, present to Board, and follow up implementation.
5. All this takes time, money, and *meetings*, and is necessary if we are to supply quality services in the areas required by Member Boards. It certainly makes more sense to do the job "once," for all 55 States and Territories, than to do it 55 times and still have no unanimity of results.

So, to those who deplore meetings, and wish to "go back to the old days—to the basics!"—we can do that only at the peril of stifling our effectiveness. I know of no satisfactory substitute for the hard work and personal involvement of dedicated officers and Committees.

Case II

1. Comity and reciprocity problems between Canada and the U.S. multiply as mobility of engineers increases. Competent engineers from each country find difficulty in obtaining a license to practice in the other's country. Member Boards of many states complain, and ask NCEE to organize efforts to communicate and coordinate solutions between all Provinces and States.
2. The Joint CCPE/NCEE Committee is formed. Meetings are held, policies reviewed, and eventually great progress will be made toward elimination of prejudicial and unreasonable barriers.

Again, this requires meetings, and the time of top Officers in both groups. But, how can they get anything done if they don't meet and get to know each other? Also, it is certainly cheaper and simpler than having all of the various States and Provinces attempt to do the same job dozens of times over!

Case III

1. Member Boards require a common yardstick for quality of engineering education.
2. ECPD is formed with joint support from the societies, schools, industry, *and* NCEE.
3. ECPD gradually drifts away from any emphasis on the effects of accreditation on the registration process, as problems such as curricula proliferation, government intervention, and industry requirements become more dominant.
4. NCEE finally gets a voting Director on the ECPD Board, and two Members on the non-voting ECPD "Advisory Council." Several NCEE Members become active Members of the EE&A Committee, although not as direct representatives of NCEE.
5. Member Boards increase pressure on NCEE Staff to coordinate better with ECPD to sell our views and our needs.

Again, this all takes meetings. How can your Officers and Staff coordinate at high level with ECPD if they don't attend at least the Annual Meeting, along with cooperation in other joint-effort meetings of such groups as Association for Cooperation in Engineering (ACE), Engineers Joint Council (EJC), NSPE, and others?

There is always a compromise between "what we feel needs to be done" and "what we can afford." Your Officers and Staff are continually trying to reach the most reasonable compromise possible, and do as much as we can with the time and funds available. Naturally, issues some Members feel are critical are of no interest to others, and vice versa. Therefore, your Board is continually trying to assess the net position of all Member Boards on each issue, and decide appropriate actions.

In this context, your President attended the following meetings during his term of office:

Directors and Zone and Annual Meetings

12/3–5/76	Directors	Atlanta
4/3–6/77	Southern Zone	Raleigh
4/19–20/77	Directors	Chicago
4/22–23/77	Central Zone	Lincoln
5/1–3/77	Western Zone	Billings
5/5–7/77	Northeast Zone	Portland
7/29–8–4/77	Annual Meeting	Atlanta

Committee and Related Meetings

9/21/76	NCRR (Steering)	Atlanta
12/1/76	UEQ and ETS	Atlanta
12/2–3/76	UEQ	Atlanta
12/9/76	NCRR	Atlanta
1/20/77	NCRR (Steering)	Atlanta
3/30–31/77	UEQ and NCRR (Steering)	Atlanta
4/21/77	All Committee Chairmen	Chicago
4/14/77	LS (Steering)	Atlanta
2/4/77	UEQ (New Exam Subcommittee)	Atlanta and Seneca
4/28/77	State Board Secretaries	Atlanta

Administrative, Staff and Related

10/19/76	Executive Director, Staff	Seneca
11/1/76	Executive Director	Atlanta
11/12/76	Administrative	Seneca
10/4/76	Executive Director, Treasurer	Seneca
4/2/77	Executive Director	Atlanta
5/31/77	President Elect and Executive Director (Interviews)	Atlanta
6/6/77	Treasurer, Executive Director (Study)	Seneca

Liaison with National Societies

10/1–5/76	ECPD Annual Meeting	Philadelphia
11/16–19/76	CCPE Joint Meeting	Ottawa
1/26–28/77	EJC Annual Meeting	San Juan
5/8–12/77	ACEC Annual Meeting	St. Louis
6/16–18/77	CCPE/NCEE-Eastern Region	Montreal

6/22–25/77	NCARB Annual Meeting	Palm Beach
6/26–29/77	ASAE Annual Meeting	Raleigh
7/10–13/77	NSPE Annual Meeting	Anaheim

All of this totaled about 74 days of meetings, plus a few hundred phone calls and other supportive activities. I feel it is all necessary if the job is to be done right and produce the best results that we can afford, and that the public deserves.

COMMITTEES

My deep personal thanks go to all of the hard-working Committee Chairmen and Members who have worked diligently to carry out their assignments this year. Our last year's efforts on committee appointments, totaling well over a hundred man-hours, have paid great dividends. The balancing of committees from standpoints of representation of all states, zone distribution, years of service, field, competence, interest, term of appointment, and others is of critical importance. Despite this effort, we still need to find better ways to maintain continuity, coupled with maximum continual infusion of new blood.

While you will hear the reports of all the committees, I would like to comment briefly on a few items.

Examinations (UEQ)

Great strides have been made by this Committee. We are now averaging over 45,000 exams yearly, and still increasing. One new discipline—Aerospace—has been approved, and three more are under consideration. A program for consolidation of "our 13th PE exam"—the combined exam—to four basic fields has been presented to all the Zones by Chairman Bechamps, and approved unanimously. An Examination Coordinator has been approved, interviews are being held, and this job will hopefully be filled by the time of the Annual Meeting. New exam development programs have generated broader sources of exam questions. The Committee now has 12 Members plus the Chairman, and is doing an outstanding job.

Finance

The new office of Treasurer is a great addition to the Council, and to Board operations. Treasurer Nelson has spent countless hours implementing the new Constitutional fiscal policies, coordinating with the President and the Executive Director, and creating the necessary forms and procedures to get our fiscal operations on a sound basis. Our excellent financial picture this year is a real tribute to his efforts in carrying out and improving on the reforms developed by previous financial committees and officers over the past two years.

NCRR

This Committee, under Chairman Haglin, had undertaken the job of redesigning the concepts of the whole program to suit the wishes of the maximum number of Member Boards. At the same time, they are striving to simplify, and reduce the cost of, the program. As you can see, with the wide variation of requirements and laws of fifty-five States and Territories, this is virtually an impossible job. They are to be commended for undertaking it at all, and deserve the support and understanding of all Member Boards in working out the most useful and practical compromise procedures.

State Board Secretaries

One impressive feature of the NCRR activities has been the cooperative review program worked out between Chairman Haglin, Executive Director Fine, State Board Secretaries Chairman Valencia and Joint Liaison Member Mary Law. Questionnaires have been developed jointly by the two Committees to assure the most effective responses. Then, in April, meetings

were held in Atlanta and Billings where Chairman Haglin reviewed the responses of all State Boards, and the draft of the proposed NCRR program, with all parties. I believe about twenty State Board Secretaries attended at Atlanta and about eight at Billings. As an off-shoot of this, it was agreed that it would be highly beneficial for all State Board Secretaries who attend the Annual Meeting to get together for discussions, probably the day before the convention starts. It was agreed that the first meeting of this type would be set up for Saturday, July 30, at Atlanta, by Chairman Valencia. This is done at no expense to NCEE, and should prove highly productive.

Land Surveyor

This Committee, under Chairman Wainwright, has been extremely active in development of the Land Surveying Exam. Staff Land Surveyor Exam Consultant Ben Buckner has coordinated securing of questions from new sources, and the Land Surveyor Committee has served as an arm of the UEQ Committee in screening and proofing problems and solutions.

In addition, the national dissemination of the Tagatz report has resulted in a heavy drain on the energies of this Committee to examine the charges, evaluate their validity, and make recommendations to the Board for action. The status of this item will be discussed separately during our sessions.

AD HOC "CARRY OVER" COMMITTEES

Several standing committees were eliminated in the new Constitution. It was my judgment, and approved by the Board, that most of these should be continued for at least this year, and some of them longer, to prevent losing the value of much work they had begun. I believe the wisdom of this was borne out by the results, such as:

Public Information

Under Chairman Viola and Vice Chairwoman Naddy, this Committee has developed an excellent "white paper" on NCEE history and functions. This will be useful for response during Sunset Law procedures, public relations, and other purposes.

Qualifications for Registration

Chairman Munger and his committee have conducted extensive studies of the examination format and procedures for scoring and determining pass-fail cut-off levels. It seems clear this is much too complex a job to be added to the already heavy load of the UEQ Committee, and that this Committee needs to do a lot more work to develop sounder and more defensible procedures.

Model Law Revision

Under Chairman Meek, this Committee has studied several changes prepared by various committees and the Board of Directors, and will report at this meeting. Without such a Committee NCEE has no practical vehicle for staying up to date on the Model Law, other than to rely on the Board. The Uniform Procedures and Legislative Guidelines Committee, into which Model Law Committee had been merged, has proven to be so overloaded it cannot effectively monitor and process proposed Model Law changes. Coordination—Yes! Elimination—No!

In this latter regard, I have discussed some of our findings with President Elect Hanna, and I understand he plans to continue the above committees on an ad hoc basis. I feel this is in the interest of the Council if we are to maintain involvement of our best talent and preserve maximum viability and usefulness to our State Member Boards. In our long overdue efforts to clean up our Constitutional house, and our struggle to consolidate and streamline, we may have in some cases tended to "throw the baby out with the bath water." I can say this since I am as guilty as you—or maybe more so. But, now after a year's operation I think we are getting a better feel for optimum

committee structures and other procedures under the new Constitution. Certainly, taken as a whole, the new Constitution represents a vast improvement.

NEW COMMITTEES—SPECIAL AND AD HOC

Ad Hoc Dues and Finance

Chaired by Vice President Samborn, this was established at the suggestion of several of our dedicated members who felt the aftermath of the "proportional vote" debate at Tucson had left some inequities that should be adjusted. Your President took great pains to select a balanced, experienced, and highly talented Committee. I think you will agree they have done a yeoman job of developing a dues structure that appears acceptable to almost everybody. This has received wide approval at the spring Zone Meetings and will be submitted for action at Atlanta. The Board unanimously urges your approval, and feels it represents a satisfactory system that will meet our present and foreseeable needs.

Professionalism and Ethics (Special)

This Committee was created by action of the Council at Tucson. Chaired by Harry Myers, of Alabama, a former NCEE Vice President, it is attempting to work with other engineering organizations to develop a simplified and uniform Ethics Code acceptable to all. Thus far they have operated without funds.

Future Procedures for Fundamentals Exam Ad Hoc

This Committee was created by Council action at Tucson to study the many suggestions and ideas that have been advanced in recent years as to the format and use of this exam. Under Chairman Gerald Hollander, of District of Columbia, they have developed an intensive questionnaire and expect to develop recommendations for our 1978 meeting. They, too, are working without funds.

International Ad Hoc

Chaired by Past President O. B. Curtis, this three-man Committee has, with no funding, compiled its first reference volume on foreign schools. This will be of great value to many Boards, and is expected to form a basis for similar publications in future years. As more registrants from other countries apply to our Member Boards, the work of this Committee should become increasingly useful.

NATIONAL TRENDS AND ISSUES

This year has seen the continuation, with increased pressure, of such items as:

—mandatory continued professional development as a requirement for license renewal,

—removal of exemptions from licensure for engineers employed by manufacturers of products for resale,

—changes in state laws to provide for more public (non-engineers, non-land surveyors) members,

—requirements for disclosure of personal assets and business affiliations of Board Members, to permit evaluation and prevention of conflict of interest.

These areas and others are being continually monitored by NCEE through the efforts of the Staff, Member Boards, the Board of Directors, and the Uniform Procedures and Legislative Guidelines Committee.

INTERNATIONAL LIAISON

As an engineer long involved in international work, I suppose it is natural that I would be more sensitive than some to the need to develop better information on license laws, examinations, education, experience, and procedures in other countries. However, in recent years the importance of this to the Council has been accentuated by the increase in foreign applicants to our Boards.

Accordingly, I have spent some time developing efforts in the international area:

International Committee

In addition to the compendium mentioned earlier, this Committee is serving as a repository to collect information on licensing laws and procedures in other countries, for ready availability to any Member Board. This is naturally a slow process, especially when working without funds, but over the coming years they will develop material of great benefit to all Members. As you know, this effort is directly aimed at carrying out objective 1.01 (e) of the Bylaws of NCEE.

CCPE (Canadian Council of Professional Engineers) Liaison

Our cooperation with our Canadian neighbors has steadily improved over the years as a result of intense personal efforts of a few Members of both groups. A new regional system established this year will set up meetings between the Eastern States and Provinces, and the Western counterparts, once a year, rotating between Canada and the U.S. Having attended two of these sessions I can attest to their value and support their continuation in the interest of all Member Boards.

World Council of National Engineering Registration Organizations (WCNERO)

Following personal visits over the past several years with registration officials in several other countries, I have noted a general interest in working out improved communications between such legal agencies. At present, the existing worldwide engineering societies appear to be based primarily on practice and professional considerations, and there is little coordination between legally constituted registration agencies. While the Common Market countries are cooperating closely, our U.S. Boards and those of many other countries, exchange very little information on laws, procedures, violations and the like.

As a result, our Board has authorized me to pursue, over a period of time, the development of a loosely structured worldwide group to facilitate better flow of information between agencies. To get things started, we are referring to this group as World Council of National Engineering Registration Organizations (WCNERO). This title is intended to imply coordination at national level only, rather than at Member Board or individual level. Obviously this will be a long-term effort and progress slowly, but it should yield increasing benefits to our Member Boards over the years. As in the case of numerous other NCEE committees and programs, this project is nonfunded.

Now, if you will indulge me in a few final moments of presidential privilege, I would like to convey two or three final expressions of appreciation, along with my sole parting recommendation to the Council.

First, my sincere thanks to my friends on the Board, the Staff, and all the Committees for their friendship, their tireless efforts, and their patience as we have worked together. This has been a great year for Mary and me, and the nicest reward is the many friendships we have made.

Next, we extend our grateful appreciation to each host and Director at all the Zone Meetings where we received such cordial receptions and were made to feel so much at home.

Finally, as a charge both to the new Officers and the Council, I urge all of you to forever remember the period we have gone through in recent years, and as you remember it, keep working at the job. No matter how competent the Staff—and right now we have a great one—there is no substitute for "every Member" involvement, and control of policy and operation by the elected Officers. We must "mind the store." Without this, ours or any organization, can wither and die. With it, we can continue to flourish. History is replete with cases of fallen countries where the leadership gradually abdicated their responsibilities, and turned things over to the Staff. A good Staff needs and deserves your leadership, your time, and your hard work. I sincerely trust we have learned our lesson, and will do no less than we should.

President's Report—1978
William J. Hanna

The Council year has rushed past at an amazing rate and it hardly seems time to report on the activities and accomplishments of the past year. Needless to say, this has been a busy and exciting term of office for which I am highly appreciative and more than ever aware of the great contributions to their profession by many individuals. It has been a privilege to work with all of you and to share in the furtherance of the Council activities and its influence in serving its Member Boards. One of the attributes of a profession is the willingness of its members to voluntarily devote time and talent to the public good and in this members of the Council excel.

STAFF

Regardless of the volunteer dedication of the members, it is the permanent staff that puts everything together and keeps the organization on an even keel. Our Executive Director has done an excellent job of directing the Seneca office activities as well as establishing himself in a liaison capacity with other engineering societies and our Member Boards. Mort Fine's experience and knowledge in the registration area is well recognized and it has been invaluable in administering the actions of the Board of Directors.

Two new positions were created this year to more evenly distribute the staff load and to more efficiently provide for the ongoing services of the National Council. Roger Stricklin was added as the Administrative Assistant to coordinate office activities and to work closely with the Treasurer in handling financial matters. He has done a fine job of reorganizing office procedures and increasing the effectiveness of Council operations by relieving the Executive Director of many of the day-by-day details.

John Von Kaenel, P.E., became the Examinations Coordinator to direct the efforts of examination questions procurement, and the preparation, distribution, and grading of examinations under the guidance of the UEQ and Land Surveying Examination committees. He also acts as the liaison officer between the NCEE and the ETS in the preparation and administration of the Fundamentals examinations. His accomplishments so far have included increasing the question banks for all examinations by broadening the base of question writers, increasing the number of reviewers and graders and improving the effectiveness of all examination procedures.

It goes without saying that the dedication of Lorraine Cauthen in the areas of Committee and Board liaison and Barbara Robinson in the areas of publications and Annual Meeting planning and execution are continuing to make the National Council responsive to the needs of its constituent members. Their excellent and continuing contributions as well as those of the rest of the staff have made my job easy and the liaison with the Member Boards both productive and smooth.

THE BOARD OF DIRECTORS

The Board of Directors is a group of individuals with diverse opinions but high dedication to the profession of engineering in general and the National Council in particular. It has been a great group with which to work, thorough in the analysis of a problem, outspoken in debate and unanimous in action. Ted Stivers as Past President has given the Board stability through his knowledge of past activities and continued participation in those of the present. Amos Kent as President-Elect is raring to go next year and full of ideas for improving Council operations. Our Treasurer, Waldemar Nelson, has been a good and steadying influence on the fiscal activities, keeping the budget in balance and a watchful eye on the savings accounts so as to maximize the financial position of the organization.

Finally, our Zone Directors and Vice Presidents, Frank Cannizzaro, Tom McClellan, Leigh Morrow and C. T. Wise have done fine jobs of coordinating Zone activities, planning and executing their Zone meetings and in representing their zones on the Board of Directors.

THE STATE OF THE COUNCIL

I am happy to report that the Council enjoys an excellent financial condition at the present time. Its total assets have constantly increased with the expectation that the reserve funds will reach the goal of one year's operating expenditures within the next year or two. Of course, inflation as well as gradually increasing services to the Member Boards will eventually cause expenditures to catch up with income. For the time being, there appears to be no need for considering an increase in membership assessment and/or examination fees.

In recent years the NCEE has increasingly become an active participant in the affairs of the engineering profession and is recognized as the authority on matters concerning registration. During the past year your officers, committee chairmen and individual members have taken part in numerous symposia and conferences on education and licensing matters in addition to contributing directly and effectively to the activities of ECPD.

The production, distribution and grading of examinations for both engineers and land surveyors continues to be the predominant activity of the National Council. The addition of the State of Pennsylvania to the fold of users beginning with the April 1979 examination period will leave only three states as independent examiners. The quality of the examinations is continually improving and a specific effort has been made to involve a greater part of the engineering community in their preparation and review. To this end, the PEAC (Professional Examinations Advisory Committee) was instituted by inviting the presidents of the discipline engineering societies to appoint an interested member to meet at the same time as the UEQ committee in a liaison capacity. The first meeting of the group was held in conjunction with the October UEQ committee with excellent success.

In addition, the deans of engineering programs throughout the country have been invited to participate, especially in the area of the Fundamentals examinations. With the same type of cooperative effort between the surveying community and the Land Surveying Examinations committee, it should become easier in the future to counter attacks of detractors.

NCEE COMMITTEE ACTIVITIES

The work of the Council is performed by its committees and, although recognition of individual effort is often not possible, its effectiveness is directly proportional to the effort expended. Reports of all the Council committees are published and I will not review them here. Suffice to say that again this year the services to the Member Boards have improved and the influence of the Council increased because of the voluntary contributions of time and talent of many members to committee activities. It has been a pleasure to work with the chairmen and to attend some of their meetings and I appreciate the dedication with which they have performed their assignments.

In addition to the standing committees established by the Constitution, several ad hoc committees were continued in order to conclude activities already underway and two new ones were established with Board consent. Those continued were the Joint International with CCPE, the NCEE/NCARB Liaison, Future Procedures for the Fundamentals Examination, International, Model Law Revision, Professionalism and Ethics, Public Information and Qualifications for Registration. Four of these have either finished their assigned tasks or their function has been incorporated in the charges to a standing committee or other group within the

Council. Liaison between the architects and our Council is handled by the President, President-Elect and Executive Director meeting with the corresponding officers of the NCARB through ICOR and the NCEE/NCARB Liaison committee is superfluous. The particular assignments to the Committee on Future Procedures for Fundamentals Examination and Public Information have been completed and in the future can be handled under the auspices of other standing committees. Therefore, I would recommend that these four committees be discharged and their chairmen and members be commended for a job well done. In my opinion the other four have a continuing charge and should be retained for the time being.

Two new ad hoc committees were created this year, the Land Surveying Examinations and the Long Range Planning committees. The first is performing a function parallel to that of the UEQ committee, but the magnitude of the task and importance of the examinations to the Member Boards dictates that separate committees are necessary for the procurement of questions and continued improvement of the examinations in the two areas. The Land Surveying committee has a large task in monitoring the activities of the Land Surveying Boards and working with that profession in a liaison capacity. The UEQ committee is already one of the hardest working Council groups and has its hands full in the preparation and administration of the Fundamentals and Principles and Practice of Engineering examinations. Therefore I would recommend that the Land Surveying Examinations committee be given full standing committee status.

The Long Range Planning Committee was created for the specific purpose of looking into the future and making detailed recommendations to Council concerning the direction its activities should take on both a short- and long-term basis to best serve the needs of the Member Boards. It is coming to this meeting with the first of those recommendations which I hope the Council will consider seriously and act upon. However, its work has not been completed and I would suggest that it continue to function for at least the next year.

PRESIDENT'S TRAVEL

In an effort to participate on behalf of the National Council in the professional affairs of the engineering community as well as those of the Council itself, I have had a busy year of travel. In addition to meetings of the Zones and Board of Directors, I have met with several of the Council Committees, the CCPE, the ECPD and other engineering boards and societies. The participation of NCEE in the affairs of the profession is, in my opinion, both necessary and desirable as a means of disseminating correct information regarding registration procedures.

LOOKING AHEAD

One of the exciting facets of an organization such as ours is that new problems continually arise and old ones require new and better solutions. Although we are presently sailing relatively smooth waters there are clouds on the horizon and it will be necessary to watch our course in order to avoid the storm.

The Iowa Board has been wrestling with the concept of Continued Professional Development and is in the process of developing a procedure for implementing the statute imposed by its legislature in this area. The Council, primarily through its President-Elect, has been monitoring the activities of that Board with the expectation that other states may soon follow the precedent set by Iowa. The idea of providing proof of continued competence for license renewal could open up a brand new game. Instead of being in the position of having to respond to the demands placed upon us, we should take the initiative in establishing the ground rules.

To this end, a new ad hoc committee has been created to develop a program of assistance to those states faced with legislation in the area of Continued Professional Development. It is

suggested that the NCEE offer its services as a computerized repository for CPD information on individuals in conjunction with the NCRR program and at a minimal charge to a State Board. This could have great advantages in the areas of comity and multiple registrations as well as relieving individual Boards of the record-keeping task. A second charge to this committee is the development of the accreditation procedures for evaluating CPD programs created by engineering societies, educational institutions and others so as to maintain a high degree of uniformity among the states.

The full impact of Sunset laws has not yet descended upon our Boards. We need to develop recommended procedures for our constituent members to follow to assure their viability under legislative scrutiny. Above all, we must remember that we exist only as an instrument of the public which we serve.

As our friends from Wisconsin can attest, attacks on the validity of our examinations and registration procedures have not ended and may indeed be intensifying. We know that the allegations being made are unjust and based upon poorly conceived evidence, but we must also convince the public of this fact. We have a good reputation and, as engineers, are held in high esteem. Our case is a good one but we must learn how to present it effectively.

The Uniform Examinations and Qualifications Committee and the Board of Directors are investigating methods for analyzing the effectiveness of our examinations and improving their content and format.

I am certain that the debate concerning the Council's role in the development of Rules of Professional Conduct will continue and that the constituent Boards may once again request direction in this area. However, before the precipitous action of 1977 is reversed, the role of the Council must be more firmly assessed and its position as a spokesman for all engineering licensing agencies affirmed by its members.

I believe strongly in our chosen profession and in the concept of registration as a means for maintaining our integrity with the public which we serve. We represent one bastion of a free society, diverse in opinion but unified in goals. Although we are unlike any other profession we have gained the respect and awe of those whom we serve. Let us continue to do our job with steadfast humility.

Thank you for the opportunity to serve as your President and for the support you have given me.

President's Report—1979
Frederick H. Rogers, Sr.

This is a preliminary report written in May to meet the printing deadline for inclusion in the *Pre-Convention Reports* and therefore covers only part of the 1978–79 administrative year. It will be amplified at the Norfolk annual meeting.

I have had the full cooperation of a capable and constructive Board of Directors which has been faced with a number of important decisions in areas affecting present and future operations. It is a pleasure to work with such a team.

The Council's financial position is good. We have essentially reached our goal of building a reserve fund equal to one year's operating expenses. However, continually rising costs indicate that almost certainly operating expenses will catch up with, and begin to exceed, income by the end of the calendar year 1980 unless more income is generated. A strong probability is that the price of examinations might have to be raised. The subject should have priority on the agenda at the Council's annual meeting in Norfolk.

The Board of Directors has selected as external auditor the accounting firm of Ernst and Ernst including the practice of S. D. Leidesdorf and Company of Greenville, South Carolina. It has also retained as General Counsel Mr. Oren O. Jones of the law firm of Jones, Newman, and Kunes of Anderson, South Carolina. Mr. Jones has given us good advice on several occasions and I am sure he will like the opportunity to meet and get to know the members of the Council.

The headquarters staff is continuing to function adequately, although greatly hampered by lack of space. I wish to express thanks on behalf of the Board and the Council to Mort Fine and all of his staff for their patience in putting up with the crowded conditions under which they work. In searching for larger quarters, the Board of Directors has determined after exhaustive search that suitably priced rental space is unavailable in the Clemson/Seneca-Anderson area and that the purchase of land and the construction of a building is the economical answer. While this is being done, the lease at the present location has been extended. A subcommittee of the Board of Directors, consisting of Alfred H. Samborn, Eugene N. Bechamps, Albert T. Kersich, and G. Leigh Morrow, is diligently engaged in this activity. It will be more fully discussed later in the agenda.

One very pleasant duty that falls to the lot of your President is that of attending the four zone meetings. This gives an opportunity to get better acquainted with more people, both because the meetings are smaller and more informal and therefore offer more opportunities to fraternize, and also because some of those present at the zone meeting may be unable to attend the national meeting.

As all of you know, the work of the Council is conducted by the various committees—by correspondence where possible, by committee meetings when the nature of the work can only be done in this manner. Where possible, I have attended a number of these committee meetings and I have gained a high respect for the dedication of the committee members and for the quality of work that is being accomplished.

In addition to monitoring in-house operations, I have maintained liaison with other engineering organizations with which NCEE interfaces. These include the Engineers' Council for Professional Development (ECPD) and its Engineering Education and Accreditation Committee (EE&A) which reviews engineering programs seeking accreditation, other national engineering and educational organizations, and the Canadian Council of Professional Engineers.

In all it has been a busy year and a productive one. I want to thank you all for the support you have given me.

President-Elect Alfred H. Samborn of Ohio will present his report together with a summary of Board of Directors' actions.

If I may take credit for anything, I would like to assume responsibility for the authorship of the Three "E" Program: Education, Experience, Examination, leading to registration. It is the three "E's" which most boards require for qualification for professional registration and, in my humble opinion, since education is the prime and basic foundation for the other two "E's," I am pleased to report that Council, indeed, did establish greater rapport with the Accreditation Board for Engineering and Technology (ABET), the American Society for Engineering Education (ASEE), and especially the Engineering College Council of ASEE (ECC), through improved communications, better committee interact relationship, and by personal attendance at some of their meetings.

In the area of "Task Analysis" activity, we have taken a giant step forward in the retention of an outside consultant to undertake a "Task Analysis Survey of Licensed Engineers." This activity will attempt to document statistically what engineers do in order to provide improvement to our Uniform Examinations Program. The progress of the Land Surveying Committee in its prior undertaking of a

"Task Analysis of Licensed Land Surveyors" has been significant and has reached the stage of the application of the survey results to the Land Surveying examinations syllabi and eventually to the examinations themselves. The work of the Land Surveying Committee in this regard has been tremendously useful in providing guidance as the engineering task analysis moves into high gear. These surveys and their resultant impact constitute a major emphasis in Council activities and I am again confident that a year from today we will better understand the results of the expenditures made to accomplish these surveys and ultimately improve the Uniform Examinations Program.

The Council remains in good current financial condition even though we are on the brink of investing in our task analysis survey and the construction of a new headquarters facility. With the astuteness of our Council Members in regard to financial matters, we will be able to keep afloat without damage to our programs. As you have been advised in the *Pre-Convention Reports*, however, the crossover point in financial affairs will be reached during the next administration; and, therefore, the Board of Directors has voted to increase the cost of the examinations used by state boards in October 1981. Your careful scrutinization of financial matters, I am sure, will support this recommendation.

Moving to the future, I am confident that the leadership of the National Council will be in good hands under President Eugene N. Bechamps, P.E.; I would only urge that Council continue to indulge in communicating with other professional and technical engineering organizations, since it is so important for our program to be fully understood by both our professional colleagues and the general public. I would also urge and encourage continuing our expanded program of communication by and through the *Registration Bulletin* and that we continue to strive to improve the quality of the uniform examination with every administration of the program.

Again, let me express my sincere thanks to all of my friends on the Board of Directors, the staff, and all of the committees, for their tireless efforts in producing the results we have experienced during this current year. This has been a great year for Peggy and me and, of course, the nicest reward is the many friends we have made.

One of the very pleasant duties that falls to the President, President-Elect, and Executive Director is attendance at the four zone meetings. As you already know from my last "Hotline," I truly want to compliment the four Vice Presidents for the type and quality of their zone meetings. All were excellent in content and developed much input for Council consideration. In addition, Peggy and I really enjoyed the warmth and hospitality extended to us at each zone meeting.

We also appreciate the privilege of serving as the Council's goodwill ambassador on the several occasions that we participated in other activities representing the Council at meetings and conferences.

So, in conclusion, "Thank you" for the opportunity to serve you as your President and for the support which you have given me.

As a result of the resolution passed by the zones, the four states that charge for verification of registration have been contacted and two have responded. The New Jersey and District of Columbia Boards have advised that they are in sympathy with the resolution opposing separate fees for verification of registration and that they hope they will be able to eliminate their charges for verification in the near future. The New York and Wisconsin Boards will attempt to handle the matter of charges for verification of registration in their states.

I want to take this opportunity to publicly thank the staff in Seneca. Mort Fine and his staff have worked long and hard during the past year. We had many goals and objectives at the outset of this administration. We did not quite reach all of them, but I am assuming that the staff will continue to

pursue those goals and objectives that were established. I think our headquarters staff is in good hands with loyal people who are willing to work at our beck-and-call. I certainly was pleased with the help and response I had during my current administration. So, Mort, I want to publicly make that announcement and say "thank you" to the staff for their help.

President's Report—1980
Alfred H. Samborn

This has been a stimulating and exciting year for me as President of NCEE, and the time has passed by rapidly. Much of the success of Council activities and accomplishments during the year has been due to the outstanding support and confidence this administration has received from so many individuals.

I have been fully cognizant that the life blood of Council flows through its committee actions and now that I have experienced the year as President, I am more fully aware of the willingness of its members to voluntarily devote time and effort to public benefit and welfare and especially to the issues that concern the National Council of Engineering Examiners. I, indeed, feel that my request in last year's President-Elect's Report has been totally fulfilled through the efforts of individual committee members responding to requests of Committee Chairmen. The program worked like a charm and I am most appreciative of the hard work and devotion of the voluntary members. Through this President's Report, I want to take the privilege of officially complimenting you for a job well done, and to thank you for your support and effort.

In addition to the volunteer effort and dedication of committee members, I also want to thank the permanent staff, which invariably puts everything together and provides the necessary continuity to keep the Council moving toward a determined goal. The Executive Director must be singled out as the leader and, through him I would like to compliment and thank the entire staff for the excellent manner in which they discharged their duties during my administration. The staff certainly worked hard and was diligent to the commitment of time restraints, meeting every deadline for completion of specific activities and always in a well-planned and workmanlike manner. I personally want to extend my "kudos" to the entire staff group.

I cannot overlook another paid staff group of individuals, who have contributed so much during this current administration by responding to every immediate request and assignment handed to them. I refer to none other than the State Board Secretaries, who unstintingly devoted time and effort in the interest of Council procedures. To you, too, I also want to extend my gratitude.

To each and every member of the Board I am proud to recount that they were always ready to stand up and be counted whenever it was required to make a decision in the best interest of the Council. I am confident that each member, both past and future, remains dedicated to the position of leadership and will provide Council with the necessary direction for success in long-term programs.

If I may take the privilege of reporting on four Council action issues during this past year, I should first like to brag about the decision of moving ahead with the construction of a new headquarters facility on the Clemson University campus. I personally was pleased with the groundbreaking ceremony, which was held on June 14 and I am confident that by our next Annual Meeting in 1981 we will proudly report that the staff is comfortably situated in its new home. In the interim, I trust the members of Council will be pleased with the renderings and model which are on display at this Annual Meeting.

Also in my President-Elect's Report of last year I raised the issue of expanded and improved communication and we accomplished some improvement in this area. The number of *Registration*

Bulletins has been increased to six during this past year and the number of pages has been as much as sixteen. This is our most important method of communication to members and I trust you have found the new format interesting. In addition, we also offered to send the Registration Bulletin to college engineering Deans and I wish to advise that a large number have taken the trouble to request receipt of the *Registration Bulletin*.

President's Report—1981
Eugene N. Bechamps

As I look back on my year as President of NCEE I can tell you that it was a hectic, busy, but most enjoyable experience. Many of our ongoing programs have reached completion and are now in the implementation stage.

A. Perhaps the single most important program to be completed is the new method for setting the cutoff scores for both the Fundamentals of Engineering Examination and the Land Surveying Examinations. This work was completed and utilized for the first time in the November 1980 examinations. We now have the best Fundamentals of Engineering Examination we have ever had in the FE and the land surveying examinations. I believe they will stand any challenge.
B. The Task Analysis of Licensed Land Surveyors was completed and the data utilized for the first time in the November 1980 Land Surveying Examinations.
C. The Task Analysis of Licensed Engineers has been completed and the data assimilated so that it can form the basis for new Professional Engineering Examination Specifications.
D. A task force has been appointed to use the data gathered in the task analysis to develop a new examination format and new scoring procedures. The challenge to this task force is to develop an examination format and a scoring procedure which will allow us to report scores to the member boards within the shortest possible time frame. This task force has now had three meetings and is proceeding full speed ahead. The target date for this new examination format and scoring procedure in the disciplines of Civil, Chemical, Electrical and Mechanical is the April 1983 examination.
E. A request for proposals was prepared and proposals received for the Fundamentals of Engineering Examination. We received many proposals from well-qualified organizations. Making the final decision was not an easy task. The recommendation to the Board of Directors was that the contract again be awarded to Educational Testing Service. The RFP Committee, however, was pleased with the quality of the proposals and noted that any of the top three proposers could have satisfactorily prepared our examination. While I am very pleased to continue with ETS, it is comforting to know that there are many others who can provide NCEE with the service, if it becomes desirable to change.
F. Our new building is now substantially complete. It is being completed on schedule, and all construction, decorating, landscaping and furnishings will be within or below the budget originally established by the Board of Directors. We were fortunate to have the professional services of Architect, Jim Neal, and his firm of Neal, Prince, Browning Architects, Inc. We anticipate moving the staff into the new building immediately after the Annual Meeting. Formal dedication of the new building, to which all Council Members will be invited, will occur sometime this fall.
G. At my request, the Committee on Finances analyzed Council revenue and expenditures and projected them five years into the future. The purpose of requesting the Committee on Finances to do this was to identify the need for constraints on expenditures or adjustments

of membership or examination fees in a timely manner. It is hoped that the continued use of this five-year financial projection will avoid future deficit budgets.

H. I have appointed a special Ad Hoc Committee on Examination Statistics to work with the American Society for Engineering Education Interact Committee in reviewing the statistics resulting from our Fundamentals of Engineering Examination. Their purpose is to determine the best way in which these statistics can be presented so that they may be of maximum value, especially to engineering educational institutions. It is my hope that NCEE and ASEE will jointly update and publish these statistics each year. Thus we will maintain a continuing record of the performance of our young engineers on the Fundamentals of Engineering Examination, and perhaps gain an insight into the quality of their education.

I. I appointed an Ad Hoc Committee on Engineering Technology and Registration to re-evaluate the Council's policy on "Evaluation of Applicants with Degrees in Engineering Technology" and their utilization in the licensing process. The report of this committee is contained in a supplement to the *Pre-Convention Reports*.

J. I have worked with the Staff and Board of Directors in establishing a Zone Meeting Manual and Guide for the use of incoming Zone Vice-Presidents. The purpose of this manual is to aid Zone Officers and Host Committees in preparing and running the Spring and Annual Zone Meetings.

None of these things would have been possible without the assistance of many, many Council Members and the NCEE Staff. I owe thanks to many of you.

First, I owe thanks to the Council itself, for granting me the privilege to serve as President.

Second, thanks to the Vice Presidents and all the Members of the Board of Directors for responding to the needs of the Council and for their prompt response to many assignments during the year.

Third, I owe thanks to all the Committee Chairmen who did such a magnificent job during the year in pushing the objectives of the Council forward. I can tell you that most committee members worked many long days, many nights and many weekends for the good of this Council.

Fourth, I owe thanks to the Executive Director for his guidance and assistance throughout the year. He is another who seems to live by the rule that weekends are made for work, and I have certainly seen the benefits to the Council of his dedicated efforts.

Fifth, I owe thanks to all the other members of the Staff for responding to my many requests and needs during the past year. Especially those which seemed to occur at the very last minute, but nonetheless, were responded to by the Staff as if I had properly planned all my time, which I had not.

Finally, I would like to thank all the members of my family for putting up with me and my hectic schedule during this past year. To my son, Gene, for helping me in many areas, especially at the Annual Meeting in Lake Tahoe. To my daughter, Theresa and her husband Ken, for reminding my granddaughter, Jessica, who Grandpa was, so that each time I have had an opportunity to see her, she remembered I was her Grandpa. To my wife, Bev, for putting up with my lost airplane tickets, wrong schedules, poor directions and last minute preparations, as we traveled from meeting to meeting.

As I look back on what has been accomplished, I can see it is really only the beginning. I believe the NCEE, which is today in possession of the most defensible series of registration examinations that have ever existed in the engineering profession and perhaps in any profession, is still only on the threshold of its possible accomplishments. We of NCEE are now in a position to provide more and better service than ever before to the Member Boards. When I look ahead and see the work yet to be accomplished, the goals yet to be achieved, the tasks seem awesome. My concern is

immediately eased, however, when I look at the leadership coming forth in the National Council in President-Elect Al Kersich. President-Elect Al, I believe, has things firmly in hand, has his programs well defined and will push this Council to even greater achievements.

Again, I thank all the Members of the Council for the privilege to serve during the past year.

President's Report—1982
Albert T. Kersich

As my year as your President draws to its conclusion, and while reflecting on some of the important things that have occurred during the past eleven months, I find that much of the work was the completion and the implementation of new programs started by previous administrations.

Some of the items which warrant your attention are as follows:

A. Examinations Program

1. New test specifications for the Chemical, Civil, Mechanical, Electrical, Structural, and Sanitary Professional Engineering examinations were developed according to the completed Task Analysis. Development of test specifications for the Book II disciplines is underway and will be completed and reviewed by the Uniform Examinations and Qualifications for Professional Engineers Committee at the 1982 Annual Meeting.

2. a. The Professional Engineering examinations were developed according to the new test specifications at an exam workshop held at the Clemson headquarters in February, 1982 under the guidance of the UEQ. Item writers from all over the country assembled for three days and basically completed these new examinations which will be given in April 1983 predicated on the new test specifications. Additionally, they completed most of the work for the Book I examinations to be used in the Fall of 1983. The workshop technique proved so successful that the concept will be continued in the coming year. Hopefully, one workshop per year will yield two examinations.

One bright point in the whole examination program has been the preparation of examinations ahead of time so that the crunch of meeting our deadline with the state boards has been alleviated. When we assemble in Minneapolis, we will have completed the assembly of all the Professional Engineering examinations through the Fall of 1983. This is the first time that the exams have been ready this far ahead of time and should smooth out the workflow for both the examination committees and our hard working staff.

b. The Uniform Examinations for Land Surveyors Committee continued their fine work this year by holding workshops in conjunction with the National Society of Professional Surveyors working through the ACSM. These workshops are providing questions and building up the examinations question bank. The Land Surveyors have led the way with the workshop concept and much of the success of the engineering workshop can be traced to the Council's experience gained from the efforts of the Land Surveyors. This committee has also completed work on the examinations through the Fall of 1983, thereby alleviating some deadline problems mentioned previously.

3. A subcommittee was appointed to study the requirements for the PM portion of the Principles and Practice of Land Surveying examination. The subcommittee by Annual Meeting will be able to present a set of guidelines for preparing the state-prepared four-hour exam.

4. A concerted effort has been made to reduce the turnaround time for scoring the Fundamentals of Engineering and the Land Surveying examinations. The efforts have been proven successful. The problems associated with the Professional Engineering exams are still under study and the results will be reported to you as soon as possible.

5. The Professional Examinations Advisory Committee has been revitalized and is taking an active role in assisting the UEQ to develop a question bank for future Professional Engineering exams. Their cooperation and enthusiasm toward the examination program is appreciated.

B. Publications

1. The Board of Directors with the help of the staff has completed work on a "Board Member Manual." For the first time, the information required by new Board Members will be assembled in one volume to assist them in understanding the role the Council plays in the registration activities as well as acquainting them with the Council and its relationship with the state boards. These will be mailed to each Board Member currently serving and to new Board Members as they are appointed.

2. The 1981 Supplement to the Compendium of Registration Laws has been completed and is available for purchase.

3. Committee work is being accomplished on a pamphlet entitled "The Practice of Land Surveying in the United States" and this publication will be ready during the coming year.

4. A comprehensive history of the National Council of Engineering Examiners is being prepared by O. B. Curtis and Mary Law. Although much of the work has been accomplished, there is still quite a bit to do before publication. A copy of the history will be sent to each member.

5. The Board of Directors has recently approved a complete revision of the Professional Engineering Examinations Volume III and the introduction of a new publication entitled "Professional Engineering Examinations Volume IV" which will contain the solutions to the PE sections in Volume III. These new publications should be available in January and April, 1983, respectively.

C. Building Facilities

This year has seen the culmination of four to five years of planning for the construction of our new headquarters facilities on the Clemson University Campus at Clemson, South Carolina. The building was formally dedicated on December 12, 1981, and the ceremony was well attended, not only by the Board of Directors and officers of the Council, but a number of representatives from professional societies as well as state board members from throughout the United States. Also in attendance were 12 Past Council Presidents. The reaction to the building has been good and it is proving to be quite serviceable. Several committee meetings were held during the year in order to acquaint state board members with the facilities as well as to develop a rapport between staff and board members. One of the interesting highlights of these meetings has been the increased efficiency in a number of Council areas. For example, by having the UEQ meet at Clemson, and having the new Word Processing equipment available, the turnaround time to make corrections to exam problems and develop new material have been substantially decreased. Some other highlights of this year have been establishment of the Executive Committee of the Board of Directors. This is composed of the Past President, President, President-Elect, and the Treasurer. By having Executive Committee meetings interspersed between Board meetings, timely decisions can be made to conduct necessary business and keep the Council moving forward.

The staff pension plan authorized by the Council last year has been implemented by the Board of Directors. This will provide needed security for the members of the Council's staff.

Word Processing equipment has been leased by the Board and installed in the Council headquarters. The Word Processing equipment is especially helpful in the areas of examinations, finances, developing mailing lists, and other items.

It has been a distinct honor for me to have been given the opportunity to serve as your President. I would like to thank the other Directors serving on my Board who did an exemplary job in the many assignments that they were asked to carry out.

I also must thank all the committee chairmen and members who accepted the charges to their respective committees and accomplished their work with dispatch throughout the year. It is gratifying to me to see these people charge into their projects with such great enthusiasm and dedication. The volunteer members are the life blood of the Council.

I owe a great debt of gratitude to the Acting Executive Director, Roger Stricklin, for his assistance and guidance throughout the past year. I know from personal experience that he spends many hours beyond what is considered the normal working day in the furtherance of the Council's business. In addition, his response to the demands for his time from the members of the Board of Directors, and his availability to committee chairmen or state board members is especially noteworthy. His lovely wife, Joyce, gets a special thanks for accepting Roger's absences with such good grace.

The Examinations Coordinator, John Von Kaenel, has also shown dedication in the performance of his duties for the Council. John makes himself available to any member of the Council at any time and he and his vivacious wife, Sallie, have entertained committee members and the Board at their home many times. Through this, they have fostered a spirit of good fellowship and better understanding within the Council.

The staff, of course, it goes without saying, is an integral part of the work of the Council. To them, I say "Thank you," not only for myself, but for the Board of Directors and Council members. The members of the staff have had to put up with a number of changes to their daily work schedule, have worked weekends and have done whatever was necessary to complete the work of the Council and to provide exemplary service to our Member Boards.

As previous Presidents, I must say thanks at this time to my wife and my family. The past year has seen a tremendous disruption in my home schedule because of the amount of travel required to do the job as President. Joan and the children have accepted this in stride and have done everything possible to assist me in fulfilling my obligations. And from Joan, sincere thanks for gracious hospitality and many favors extended her way wherever she went.

Every year sees some work come to an end and new work start toward the furtherance of the Council's objectives. The development of a more defensible and a better examination program which will protect the health, safety, and welfare of the public is of course our primary concern. As I review the work that has been completed by President-Elect Carew in the development of committees and committee charges, I feel secure in the knowledge that a year from now, we'll be further along in the obtainment of Council objectives.

Again, thank you for allowing me to serve as your President, and let's all join together and assist President-Elect Carew in the accomplishment of the Council's objectives during the coming year.

President's Report—1983
William E. Carew, Jr.

The year has been one of consolidation, growth and planning for the future.

NCEE's most important function is to provide examinations to you, the Member Boards. This continues to grow in quality and size. An able and dedicated committee with the support of a hard working staff and the cooperation of the technical societies, through the Professional Examinations

Advisory Committee, is continually improving engineering examinations. The program has progressed well under the chairmanship of Marion Smith. The Uniform Examinations and Qualifications (UEQ) Committee, its consultants, and item writers have devoted numerous hours and considerable effort to developing the examinations. The Fundamentals of Engineering Examination is being constructed and reviewed under the able direction of a sub-committee headed by Quentin Ford. They are assisted by the Educational Testing Service (ETS) under contract to produce and score the examination.

Probably the most important achievement of the UEQ Committee has been the development of a Minimum Passing Standard for scoring the Principles and Practice of Engineering Examination. This has been under the able direction of John Pearson with guidance from examination consultant Wiley Boyles. The new method of scoring will be tested on the April 1983 Examination. The October 1983 Examination will be scored by both the current method and the new method. Scores will be reported on the current method. Following an analysis of the results of the new method of scoring, it will be implemented for the April 1984 Examination.

The task analysis confirmed much of what had been previously incorporated in NCEE examinations. Some changes were made in the examination specifications, and the judgment factor has been modified to fully conform with the task analysis. The civil, sanitary and structural examinations have been restructured as a single examination in Book I. All of these changes were incorporated in the Principles and Practice of Engineering Examination administered in April, as well as the October 1983 examination which has had a final review and is ready for printing. In addition, the April 1984 and October 1984 examinations have been constructed with their scoring plans, as well as April 1985 and October 1985 in large part. Chap Noble guided these through the workshops in February and April. We need to continue our efforts with the Professional Examinations Advisory Committee (PEAC) to provide fewer, more comprehensive examinations. You will find more detail in the UEQ Committee Report of the progress made in this important area.

I would be remiss if I did not acknowledge the very considerable support of the staff. John Von Kaenel has been instrumental in bringing together the item writers and graders necessary to support the UEQ in this major effort.

The Uniform Examinations for Land Surveyors (UELS) Committee preceded the UEQ Committee in undertaking a task analysis. They are now engaged in a second task analysis, modeled after that conducted by the UEQ Committee. The results of this effort will be used to verify and update the current Land Surveying Examinations. Meanwhile, guidelines have been issued to assist the Member Boards in constructing more uniform examinations for Part IV. All of this has been ably handled by the UELS under the chairmanship of Jim Shiskin, assisted by Vice President Harry Parker.

Our examinations are well respected. How well respected was illustrated in a recent meeting with the Illinois Professional Engineers' Examining Committee, a part of the Illinois Department of Registration and Education. At the request of the committee, the department recently was provided information on the NCEE examinations. Further, on April 8, President-Elect Paul Munger and I met with the Professional Engineers' Examining Committee and members of the department to discuss the examinations, their background and validity. Frank E. White, P.E., a member of the Illinois Examining Committee, arranged an informal discussion the previous evening. While we were present, the committee overwhelmingly decided to use the NCEE Fundamentals and Principles and Practice of Engineering Examinations, starting in October 1983. This is subject to resolving minor scheduling problems and approval by the department. We were assured these will not present an obstacle.

Illinois has separate registration committees for structural engineers and for land surveyors. We have been invited to meet with these committees later in the Spring, and, of course have accepted. The Hawaii Board has expressed an interest in the NCEE Land Surveying Examinations.

Our Acting Executive Director arranged for a presentation to be made to the Deans' Institute in March at Hilton Head Island, South Carolina. The increasing value of registration, the increased use of the Fundamentals Examination, and the improvements recently made in that examination were included in the illustrated presentation made to the deans. They were favorably responsive in their questions and comments.

NCEE continues to work with the technical societies through PEAC to develop the examinations. We are indebted to them for their support and for the efforts of their members in supplying items and assisting our UEQ Committee in developing questions for the examinations. Liaison with the technical societies is important to our examinations programs.

The current contract with The Educational Testing Service (ETS) expires in December 1983. It is important that we have approval of a new contract in August. We must weigh carefully the cost and services to be provided. We have reviewed proposals received from five firms for producing the Fundamentals of Engineering Examination (FE) for the next three years. The firms have been visited, personnel have been interviewed, and you will hear details of the proposed contract during this meeting. It is vital that we maintain the quality of our examinations program. Due consideration must be given to the cost, but we cannot rest here.

NCEE must look carefully at all aspects of services to the Member Boards. We must continue to improve the examination program.

We must continue our efforts with the Professional Examinations Advisory Committee to provide fewer, more comprehensive examinations. Advancing technology offers opportunity for new forms of examinations. NCEE must monitor such advances and make indicated changes to keep pace. The growth in engineering enrollment and increases in examination usage dictate that we must look carefully at the composition and size of our staff. Facilities must be adequate to house expanding operations.

New publications during the year included Typical Questions Pamphlets for the Principles and Practice of Engineering Examination and a new volume for the Fundamentals of Engineering Examination. The latter included answers. It is planned to issue another Volume for the P.E. Examination, to include answers. These publications serve to update our examination material to conform with the revised specifications.

The NCEE continues to grow in services provided, stature and quantity as well as quality of examinations provided. The number of Fundamentals of Engineering Examinees is growing at approximately 8 percent per year and the number of Professional Engineering Examinees is growing at approximately 1 percent per year. It is anticipated that the administration of NCEE's examinations by Illinois will increase usage of the Fundamentals of Engineering Examination by approximately 1,400 and the Principles and Practice of Engineering Examination by approximately 1,000 per year.

The future of NCEE promises to be one of growth. More students are entering engineering schools each year in spite of limitations on enrollment. More than 60,000 graduated last year; of these more than 40,000 took the Fundamentals of Engineering Examination. Ultimately, this and other positive factors will result in the use of more P.E. Examinations.

Another significant change is taking shape in the records program. Earl Radding and his committee have been developing recommendations: (1) For making the program more acceptable

to member boards; (2) for encouraging its use by professional engineers; and (3) for incorporating the record of the engineer-in-training and tracking his experience record. This will ultimately encourage registration. It will provide a useful resource for prospective employers and encourage their recognition of registration.

I hope you will take the time to read the committee reports. I will not go into details here on all the reports. Suffice it to say the committees have been responsive to their charges. The time and effort devoted by these people has been impressive. Their work is a vital function in the NCEE. It is what makes NCEE recognized and respected.

The finances of the organization have never been in better order. The proposed budget provides for a modest increase in our reserve fund. The headquarters building is clear of debt. Adequate funds are provided for examination development.

A history of the NCEE is being compiled by O. B. Curtis, Sr., with the assistance of Mary Law. A first draft is scheduled to be ready for the annual meeting in 1984.

Our staff is doing a fine job. It is a lean operation and well run under Roger B. Stricklin, Jr.'s, direction. We do not need to be thinking about augmenting the staff. We need to consider the future both in terms of growth and training adequate backup for the long term.

My sincere thanks for the honor and privilege of serving as Council President. To Roger and the staff, thank you for your efforts and assistance. To the committee chairmen and the committee members, thanks for a job well done. A special thank you to John and Sallie Von Kaenel for their hospitality to so many workers at the close of many a long day.

I am confident that President-Elect Munger will have your support in the coming year. We must continue to support with time and effort the NCEE programs that will insure the recognition by the public of our sincere efforts to protect life, health and property. Registration is the cornerstone of the professional engineer's career.

President's Report—1984
Paul R. Munger

This has been an exciting and challenging year. Committees have worked diligently and have made great progress in addressing their charges. I would like to mention a few of them specifically because their recommendations will have an impact on Council decisions. You have reports from each in the *Pre-Convention Reports*.

The Constitution and Bylaws Committee has undertaken a complete and thorough review of the NCEE's Constitution and Bylaws to insure conformity with the goals, purposes and objectives of the NCEE. They will be presenting recommended revisions to the Constitution and Bylaws at this annual meeting that will reflect activities also reported on by other committees such as Long Range Planning, Records Verification, Finance, Communications and Publications, and Office Automation, to name a few. The entire review will not be completed by the time of this annual meeting, but I am sure that President-Elect Wainwright will include the completion of this task as a charge to the Constitution and Bylaws Committee for next year.

The Records Verification Committee has addressed the charge of examining the existing records program of the NCEE and will make recommendations to improve the viability of this program over the next five to ten years. As a result, this committee will be reporting on a proposed Intern Records Program for Engineers-in-Training, and at the same time, will make recommendations on the records program directed toward professional engineers. (This

committee has, in the course of its work, completed a Request For Proposal (RFP) which is discussed in the committee report.)

The Office Automation Committee (Ad Hoc) has also completed an extensive review of the Council office operations and anticipated automation needs over the next five to ten years. The committee is finalizing an RFP which will be sent to potential automated equipment suppliers. Certainly, the recommendations of this committee will impact on the operations of the office resulting in increased efficiency in the day-to-day operations, as well as more rapid and effective communication with state board offices. I might add that the Communications and Publications Committee has also been involved in this process, and recommended to the Board of Directors that a consultant be hired to assist the NCEE in its publications program. This has been done.

This year, several additional ad hoc committees were appointed. One that I would specifically like to mention is the Committee on Public Members. This committee was given the charge of determining, in general, the effectiveness of boards in fulfilling their responsibilities to the public and the relationship of public members in their roles on member boards and in the NCEE. This committee has been active and has requested information from the various state boards which will be reported at the Annual Meeting. It appears that there is a need for such a committee within the NCEE and that it can fulfill an important aspect of NCEE operations.

In October, an article which appeared in the *Engineering Times* implied that the NCEE was studying the possibility of a single examination covering all disciplines to be followed by a post-certification program by the technical societies. This resulted in numerous calls and letters expressing concern that the NCEE was studying these issues. As a matter of fact, the possibility of a unit examination had been discussed within the Professional Examinations Advisory Committee (PEAC) on a preliminary basis. However, this group had not reached a consensus nor had they, at the time, made any recommendations to the Board of Directors through the UEQ Committee to either pursue or not pursue the development of such an examination. Very little, if any, discussion had been held within the Board of Directors on post-certification by technical societies. I requested that the NSPE, in its next issue of *Engineering Times*, retract the article. Also, I wrote a letter to the Editor which appeared in the *Professional Engineer*, indicating that the NCEE had not studied either issue. This entire matter apparently was the result of discussion that took place within the Participating Organizations Liaison Council at its meeting in Albany last year. The effort to get a retraction of the article in the *Engineering Times* included letters to the individual participating bodies of the American Association of Engineering Societies (AAES). Three of these societies responded to our letter.

In April 1984, the administration of the Fundamentals of Engineering examination was accomplished with our new contractor, American College Testing (ACT). The NCEE has been most pleased with the excellent relationship that has developed between ACT and the NCEE, and the fact that the quality of our examination has been maintained. The efficiency of the administration of the examination has also been excellent. Perhaps the most important aspect of contracting with ACT has been the significant cost savings to the National Council . . . a cost savings of almost one-third.

This year, we tried a new approach to the traditional meeting of all committee chairmen with the Board of Directors. In the past, it was felt that having all committee chairmen come to a meeting of the Board of Directors to present their annual reports which were to be printed in the *Pre-Convention Reports*, was often unnecessary, particularly in some cases. There are some committees, which in the conduct of their work, must interrelate with other committees of the NCEE. In

addition, every committee has the responsibility of recommending charges to the following year's committees. This year approximately ten committee chairmen met with the President-Elect, Treasurer, and me in Atlanta to present the deliberations of their committees and the recommendations they would be making. In many cases, there was obvious overlap of activities and this meeting gave these chairmen the opportunity to discuss the interrelationship of the committees' work. It turned out to be a very effective meeting and future meetings of the same nature will not only be effective but also cost saving. Certainly, where the work of one committee impacts on another, it is important that the committee chairmen, at least, have the opportunity to discuss those impacts and the effect they have on the finances of the Council, Constitution and Bylaws, and next year's administration.

In February, the Board of Directors decided to request all state boards using the NCEE examinations to return all used and unused examination booklets either to ACT (in the case of the FE exam) or to the NCEE (in the case of the PE and LS exam). We have always been concerned about the security of our examination program and although the returning of all examinations will never completely eliminate the possibility of examination compromises, it was felt that this would be an added step in assuring accountability. Realizing that this might be an imposition on some boards, the Board of Directors instructed the Executive Director to assist in all ways possible to ease the burden in those cases.

We are presently negotiating with the Accreditation Board for Engineering and Technology (ABET) to establish the annual dues we should pay for our membership as a participating body of ABET. At its April meeting in St. Louis, the ABET Board of Directors voted to establish our annual dues at $10,000 per year. This is consistent with their Constitution and Bylaws which directs their Board of Directors to establish dues for those participating bodies which do not have a membership, per se. We presently pay $5,308 which is an increase over the $2,000 we were charged last year. We are considering the possibility of requesting two directors; however, because of some problems with other participating bodies of the ABET, no decision was made or consideration given to that possibility at ABET's April meeting.

I have invited President Millar of ABET to meet with our Board of Directors to discuss the purpose and future of the Related Accreditation Commission (RAC) provided for at the ABET annual meeting in October in Atlanta. The American Congress on Surveying and Mapping has developed a pilot program for the accreditation of land surveying by the RAC, including the establishment of program criteria and guidelines to be followed during accreditation visits. This causes some concern since it appears now that the accreditation of surveying programs is being fragmented. It is our understanding that engineering surveying will be accredited by the Engineering Accreditation Commission (EAC), surveying technology by the Technology Accreditation Commission (TAC), and land surveying by the RAC.

As a result of the actions taken at the four Zone meetings this spring, I appointed observers to both the TAC and RAC. Each Zone passed a resolution recommending that an observer, rather than a representative of the NCEE be appointed to these accreditation commissions. Simultaneously, we have had input from the Association of Northeast Boards of Land Surveyor Registration that strongly opposes such actions on the part of the NCEE. This is an issue which I believe the whole Council should discuss and attempt to reach a consensus.

At the Western Zone meeting held in Tucson in early May, several members of the Board of Directors and the UEQ met with members of the California Board to discuss concerns that

California has about the Principles and Practice examinations. California has requested that NCEE give the Book I exams only once a year and that the examination booklets be given to each examinee immediately upon completion of the exam. In addition, they have suggested that our examinations emphasize practical experience rather than academic training. In the event the NCEE cannot provide such an exam, California has indicated that they intend to withdraw from the NCEE by 1986. I believe that our dialogue with the California Board members was very productive and I look forward to a meeting of their Board and our Board of Directors prior to the opening session of our Annual Meeting.

I want to take this opportunity to express my deep appreciation for the honor and privilege of serving as Council President. Special thanks go to the committee chairmen and committee members who gave so willingly of their time on behalf of NCEE. I also want to express my appreciation to Roger Stricklin and the staff at headquarters for all the assistance and help they have given. A special thanks also goes to John Von Kaenel and his wife, Sallie, for the many times they opened their home to the many people who were in Clemson on Council business. I want to thank each of you for the strong support and help you have given me this year.

I cannot say enough about the opportunity I have had to work with your President-Elect Sam Wainwright. He and I have been together in the Council for ten years on several committees and on the Board of Directors. Sam and I have gotten to know each other much better this year, and I am proud that we have worked as a team. I have leaned on him and he has leaned on me in preparation of his tenure as President. It is rare that two persons are afforded the opportunity to work closely enough to get to the point that they begin to think somewhat alike while at the same time, maintaining their individual identity. I believe Sam and I have accomplished this on a deeper scale because we both have kept in mind that we are representing the NCEE. I am confident that you will give your support to President-Elect Wainwright. He will be an outstanding president of the NCEE.

President's Report—1985
Sam H. Wainwright

As the annual meeting approaches, suddenly one realizes the year is almost over and you begin to reflect on what has transpired over the past twelve months. As loose ends come to mind, there is a sense of urgency. Any feeling of accomplishment is diminished by the realization that some opportunities have been missed and a few issues lie unresolved. However, a tremendous amount of work has been accomplished during the year. The effort of the committees has been outstanding. They have undertaken their charges with a renewed sense of enthusiasm and purpose.

A change which began a few years ago has continued to move the Council's attention away from complete concentration on the examination process to a broader study of the total registration system. Education and experience qualifications, as well as exam qualifications, need in-depth study in order to develop interrelated standards for admittance into the registration process. Model statutory rules of professional conduct and responsibility along with strict enforcement procedures need to be emphasized by the Council so that the professional commitment aspect of the registration system receives as much emphasis as the qualifications requirements.

During the past year while visiting with other organizations related to the engineering profession, it became clear to me that the significance of the professional registration process was, to some degree, misunderstood. The public, as well as many segments of the profession, have little understanding of what the process accomplishes. Some engineering organizations which credit their

origin to the registration statutes give the process only meager support. There is an urgent need to disseminate information about registration so that engineers do not lose sight of the system that endorses their profession via statutory authority. The Council must assume leadership in this area. Even though the continuous improvement of our exams is our first priority, in-depth studies of education and experience qualifications, rules of professional conduct and their enforcement are of equal importance to registration. We must commit additional resources to aid our member boards by addressing every facet of registration as thoroughly as we have the examination of applicants.

During this year, the ABET Committee, under the direction of Past President Al Kersich, addressed several issues related to educational qualifications. The committee prepared a questionnaire on educational matters and compiled a list of NCEE publications which should prove useful to educational institutions. They also addressed the accreditation activities of the Accreditation Board for Engineering and Technology (ABET), namely the identification problem related to the many various curricula under the Engineering Accreditation Commission (EAC), the Technology Accreditation Commission (TAC), and the Related Accreditation Commission (RAC).

ABET should be complimented for keeping all the various criteria related to engineering under one umbrella. However, in doing so, they have created a problem for the public, as well as the profession, with regard to being able to differentiate between the various accredited curricula. For years, ABET accreditation stood for a B.S. degree in an engineering curriculum meeting very specific standards. Now, only those very familiar with ABET procedures can recognize the differences in curricula bearing the ABET seal of approval. As a result, all ABET accredited curricula are assumed by the public to lead to traditional engineering degrees. This problem adversely affects the registration process as it did in Montana this year when the legislature required the board to give equal weight to EAC and TAC degrees as far as educational qualifications for registration are concerned. The same confusion is present in the area of employment where some personnel managers give equal weight to TAC and EAC accredited degrees when filling engineering positions. NCEE must help reestablish a means of readily identifying engineering curricula which meet the educational requirements for registration.

For the past seven years, NCEE and ABET have been embroiled in a dialogue regarding dues and representation to the detriment of registration. The Council's ability to present its case for more precise identification of curricula and standardization of course requirements has been diverted by the perpetual discussion on dues and representation. It is certainly not to the Council's best interest to allow this distraction to continue; however, when attempting to resolve our differences, it is very difficult to reach the ABET Board of Directors.

The Council is attempting to improve its communications with ABET by asking for a second ABET Director. Last year, our Bylaws were changed to allow our Representative Director to the ABET Board of Directors to be appointed for a three-year or longer term. With the Bylaw change and two ABET Representative Directors, the Council can maintain continuity and longevity which will greatly improve our ability to become involved in ABET activities. One extra vote on the ABET Board is not of real significance to us; however, resolving our communications problem is of the utmost importance to NCEE.

This year an Experience Qualifications Ad Hoc Committee was appointed with Harry Parker as Chairman. This committee was charged to study and develop an experience model which could be used in forming an experience record system for the Intern Records Program. The study of experience

qualifications will help develop standards for evaluating experience which will be related to the engineering exams through the task analysis. A new engineering task analysis based on the experience requirements developed by this committee will be forthcoming in the near future. This committee has been organized, charges have been developed, and the committee will go into full operation next year.

The Communications and Publications Ad Hoc Committee, under the leadership of Bill Dickerson, identified as our number one communications priority the ability of the Council to communicate the meaning of registration to the engineering profession and to the public. The committee developed a prototype speaker's kit that will be available to member boards for use in presenting information regarding the registration system to various groups. A slide presentation, with script, has been developed which gives the history of engineering and the registration process. The committee also developed improvements to the *Registration Bulletin* by placing articles which focus the attention of the engineering community on registration.

Another Ad Hoc Committee, the Legal Recognition of Engineers, under Paul Munger, was appointed to develop information on registration to be used by the Council through the Communications and Publications Committee. The material produced by the committee will explain the registration process and its effects on our society.

The Participating Organizations Liaison Council (POLC), under Chairman Bob Flory, met at Clemson with eleven of the twenty societies represented. The POLC was presented an extensive briefing of NCEE's activities during the past year. Several issues were raised by POLC representatives and will be assigned to various committees next year for study. POLC representatives were also asked to furnish to the Council information that their respective organizations had generated with regard to registration. The POLC proposes to have another face-to-face meeting next year with an earlier date to better fit the schedules of the other nine societies which could not attend the meeting this year. As President, I can assure you that this meeting was most beneficial to me in understanding the viewpoints of the various POLC member societies.

The Council History Ad Hoc Committee, under Chairman O. B. Curtis, engaged a new writer this year to prepare a draft of the Council History. Ms. Pat Gergel from Columbia, South Carolina, was retained to complete the rough draft of the History by the annual meeting. Ms. Gergel will be listed as editor of the Council History and O. B. Curtis, Sr. as author. Soon after the annual meeting, we hope to approve the Council History for publication.

The Professionalism and Ethics Committee, under Sammie Lee, met three times this year in an effort to redraft the Model Rules of Professional Conduct. The groundwork for this undertaking began in 1981 with a study of the Model Code by John Kultgen, Ph.D., Professor of Philosophy, University of Missouri, Columbia. The new Code, which will be presented for adoption by the Council in August, will have a new format based on personal experiences, such as an engineer's relationship to his employer or an engineer's relationship to another engineer, etc. It is my hope that state boards wishing to revise their Codes of Professional Conduct will take advantage of the availability of the background material and the revised Model Code and use this information in reviewing their own codes. It is my personal belief that consideration should be given to the development of a uniform Code of Professional Conduct which all states could use and which would be accepted as a uniform Code of Conduct for all registered engineers.

The Law Enforcement Committee, under Paul Taylor, has revised the Law Enforcement Manual and added a new section on Disaster Investigations. This was a tremendous effort this year which has been completed and is ready for presentation to the Council.

The International Relations Committee, under Art Jensen, studied new means of processing applicants educated in foreign universities by using World Education Services, Inc., of New York to interpret and verify foreign degree documentation. The committee also looked into the liability requirements for registration as proposed by Ontario. In addition, four more countries were studied by the Foreign Education Subcommittee chaired by O. B. Curtis, Sr.

The Uniform Procedures and Legislative Guidelines Committee, under the guidance of Chairman Lewis Melton, completed the preparation of the Model Rules and Regulations. This document will be presented to the Council at the annual meeting for approval.

The Records Verification Committee, under Gene Bechamps, has undertaken a marketing analysis for our proposed Intern Records Program. This step was taken this year due to the very high cost of proposals to administer the Intern Records Program. The cost of manually entering experience data into a Record Processing System, caused us to put the Intern Records Program on the back burner until a more economical method of recording experience information could be developed. In light of this problem, the Ad Hoc Experience Qualifications Committee is studying the possibility of a machine-processable experience record.

The Public Member Ad Hoc Committee, chaired by Bob Stewart, met in Clemson at which time the committee was given a detailed briefing on Council activities. The program included discussions of the various Council committee charges and the process served as an orientation for the public members and a means of identifying those public members who wish to participate in the other committees of the Council. The deliberations and recommendations of the committee contained in the 1984 Annual Report were of particular assistance in planning future utilization of public member expertise by the Council.

The Advisory Committee on Council Activities, under Fred Culpepper, began a long-range planning process which involved the Council's Board of Directors and Executive Committee in an effort to develop a long-range direction for the Council as well as a system for annually updating a long-range plan. Based on the efforts of the committee, it is my conclusion that the process must be an endeavor which includes the Board of Directors so that current problems may be related to and directed toward long-range goals.

The Constitution and Bylaws Committee, under the able leadership of Herman Smith, addressed quite a few new issues which were debated at the zone meetings and will be brought before the Council at the annual meeting. Some of these issues are housekeeping in nature; others give a change of direction for certain committees and others correct conflicts that exist as far as Council procedures are concerned.

The Land Surveying Committee, under Chairman Bernard Larson, completed a compendium on state standards and is preparing a model standard that may be used by states as a guide in the preparation of new state standards. This committee also undertook a liaison mission with the various surveying societies which has proven very beneficial this year and we hope will continue in the future.

The Uniform Examination for Land Surveyors Committee, under Chairman Ferrell Prosser, has produced four complete exams and is presently working on the exams for October 1987. The committee also held an extra meeting this year to produce items to fill the land surveying exam item bank. More than 100 new exam items were produced which put the committee beyond their goal of being four exams ahead.

The Uniform Examinations and Qualifications for Professional Engineers Committee (UEQ), under Chairman Charles Kimberling, is working on various stages of the engineering exams through 1987.

Exam production has fallen a little behind this year due to an unusual amount of time and effort spent accomplishing the change in the scoring method for the PE exam. We have replaced the norm-referenced scoring system with a criterion-referenced grading system and we have introduced various check procedures to minimize grading bias inherent with essay type questions. The committee also produced an eight-hour and a sixteen-hour third level structural exam which will be offered in October 1985 to those states requiring separate structural examinations. This exam is not intended to replace the Civil/Sanitary/Structural Exam, but it is primarily designed to be used by those states that require structural authorization after PE registration. As usual, the UEQ Committee's performance was outstanding and Charles Kimberling should be given special recognition for this year's accomplishments.

The Advisory to the UEQ Ad Hoc Committee, under the leadership of Chairman Chappell Noble, has spent a tremendous amount of time and energy studying the development of PE exam items which can be objectively scored. The committee is also looking toward the eventual evolution of the PE exam to a computer-administered format. If the new multiple-choice process is accepted by the Council, the tremendous amount of resources which are used in grading essay questions, particularly those efforts to eliminate grading bias, can be reallocated to the preparation of questions which are machine-processable and objectively scored. The efforts of this committee will be the subject of our Tuesday Panel Discussion at the annual meeting.

The Finance Committee, under the able leadership of Rudy Kuchar, and Treasurer Harry Parker, has reported an excellent financial statement this year. Annual surpluses have replaced the reserve funds expended for the Council headquarters building and equipment and has brought us to a point where we now have a nine months cash reserve. Projections for the future show positive cash flows for the next four years; however, anticipated exam improvements will bite into our cash reserves and may cause a flattening of reserve growth. By and large, due to the excellent management systems and controls developed by Roger Stricklin, the Council's Board of Directors is kept current and abreast of our financial position.

By and large, the Council is in excellent condition. The staff morale is high even though manpower has been somewhat strained by the change in grading procedures for the PE exam. This high degree of proficiency of the Council operation can be attributed to the professional management ability of our Executive Director and the loyalty and dedication of the Council staff.

This excellent staff combined with the unbelievable talent and drive of the volunteer members of this Council makes this organization probably the most productive in the engineering world. Members like Charles Kimberling who has, for the last two years, directed the production of the engineering exams and Ferrell Prosser who has been responsible for the surveying exam production are exemplary of others who donate a tremendous amount of time and energy to this organization.

It has been a privilege and an honor to have been allowed the opportunity of serving as Council President. I want to express my appreciation to the committee chairmen and members who gave so much of their time and energy. To Roger Stricklin and the Council staff who supported our activities, I recommend a special commendation. On behalf of all those who were entertained by John and Sallie Von Kaenel in their home in Clemson, may I express a heartfelt "thank you."

Kitty and I have enjoyed meeting the Council members and their families during the travels of the last two years. We hold dear their friendship. Above all, we thank the Council members for their support and patience and for making this year possible.

Before ending this report, let me express to Paul Munger who last year through his wise counsel headed me in the right direction, and to Ed Pine whose judgment and experience maintained that

course, may I extend my deepest gratitude. Ed's twenty-five years as a state board member and his many leadership roles in Nevada bring to the Council a wealth of experience. Above all though, like Paul Munger, Ed has an unselfish regard for the welfare of NCEE. Please join with me in pledging our support to a man who is destined to be an outstanding Council President.

President's Report—1986
Edward L. Pine

When I was installed as President-Elect I began planning ahead with much anticipation for the year when I would serve as President of NCEE. I was certain that much could be accomplished, primarily because of the efforts of those who have preceded me; however, as we will move into a new administration many of my objectives have yet to be accomplished.

I do not intend to discuss in this report all the activities of the committees. The chairman of each committee will make a report to the Council. The committees are the heart of NCEE. Their interest and work provides a benefit to the Council that could not be acquired by any method other than the efforts of many individuals working for the profession they admire and respect. I will mention a few of the items that will require additional support from the Council.

The Council, Southern Zone and the board of directors were greatly saddened by the untimely death of Vice President Chappell N. Noble. Chap served the engineering profession in many ways. He was deeply involved in the efforts of the Council to develop an examination which would indicate the practical experience as well as knowledge that the examinee possessed. He devoted much time endeavoring to establish an objectively scored Principles and Practice of Engineering Examination. His leadership will be missed by all of us.

At the 1985 Annual Meeting the Council authorized the board to seek ways to improve the PE examination. Various complaints had been received as to the time required and the cost of scoring the exam. The examination committee and the directors discussed the many facets of the examination procedures. It was their consensus that a machine-scored, or objectively scored examination might solve some of the problems. A Request for Proposal (RFP) was prepared by the Examination Review Committee (ERC) and six prospective groups were invited to bid; however, only two submitted proposals in response to the RFP.

The directors and members of the ERC met and interviewed representatives from each of the two firms. A firm was selected based on the best technical proposal and most favorable costs and a contract was signed in April. It must be pointed out that this examination which may be administered in 1988, will consist of 25 percent objectively scored items. The remaining 75 percent of the exam will be the same type of exam currently being administered.

This past year a professional communications firm has been directing the Council's efforts to publicize the benefits of professional registration. One of their accomplishments was developing a speaker's kit. The theme of the kit explains the advantages of being a Registered Professional Engineer and it includes speech outlines, slides and fact sheets. The purpose of the kit is to offer State Board Members a tool to use in speaking on the benefits of registration to the public, the engineering profession, engineering students and engineering faculty. The kit is part of a program to better educate the public and non-licensed engineers on the importance of the profession of engineering and to understand the meaning of the initials "P.E."

During the recent zone meetings I learned that very few board members have actually observed or used the slides. All are urged to become familiar with the kit and to use it in furthering the

registration process. The use of the kit will provide a worthwhile program for the public, faculty and students and engineering societies.

NCEE has continued its endeavors to improve relations with ABET; however, ABET is considering other activities which we do not believe contribute to the quality and standards of engineering evaluation. There will be little opportunity for NCEE to improve its position in the foreseeable future. It appears that ABET will probably move from New York to Washington, D.C., and it is possible that the make up of the ABET Board will be changed to reduce the number of directors. In March of this year at the instructions of the NCEE Board of Directors I made several recommendations to ABET. These included that the Executive Committee of ABET be dissolved, that only member bodies have representative directors on the board, and that representation be limited to no more than two directors per member body. We also proposed that only those member bodies responsible for 200 or more accredited programs have a second seat on the ABET board. We recommended that the ABET board meet four times annually and management of the organization be returned to the board of directors. Our final recommendation was that more lead time be built into the budgeting process. In particular, we feel that a budget plan should be developed which projects the budget three to five years in advance and that member assessments be approved at least two years in advance.

A change in the definition of the practicing of engineering (surveys) in the Model Law which was adopted in 1984 is developing into a debate between ASCE and ACSM. The Model Law is a document that should be accepted by all societies and eventually adopted by all member boards. POLC indicated to NCEE by letter of March 12, 1986, the concerns of the engineers and the president of ACSM, raised the same concerns in a letter last November. NCEE must encourage and assist in settling the dispute amicably.

Upon the adoption of a Criterion-Referenced Scoring Procedure, the number of requests for rescoring P.E. Exams has increased dramatically. The board of directors, and UEQ Committee have discussed and reviewed the policies concerning rescoring. It is believed that member boards could do a much better job of screening requests for rescoring and submit to NCEE only those requests that have merit. If the examinee cannot offer a valid reason for rescoring the member board should disapprove the request. We have been advised that if the procedures adopted for examinations are such that an examinee can be reexamined within one year, using a similar exam, there is no legal requirement to rescore examinations. We are continuing to investigate this possibility.

It has been suggested that the board of directors investigate a possible reduction in the number of days provided for administering the exams. Presently, a three-day period, twice a year is mandated. The executive director has been instructed to investigate the requirements under which the boards operate and the frequency of exams required by the state laws.

At the State Board Secretaries meeting held at Atlanta in November 1985, it was suggested that a secretaries round table discussion be held in conjunction with each zone meeting. This was instituted at the 1986 zone meetings and the round table discussions were well attended with one exception. The topics discussed were relevant and it is recommended that they be continued. The host board should provide an agenda. A similar procedure is planned for the annual meeting in 1986.

For the past several years the presidents of NCEE have reported, with pride, the financial condition of the Council. I also have the privilege of reporting that the financial position of the Council is excellent and that the total of the funds exceed all previous reports. The executive director presented information to the Council at the Zone Meetings concerning the costs and

income of the examinations. It is important that the Council remain financially sound; however, I also believe that more effort must be put forth to endeavor to lower the costs of the individual examinations. More facts should be gathered and the use of the reserves considered. I believe as a final consideration the facility at Clemson be reviewed. It is my thought that additional space will be required in the near future. During exam workshops and the grading processes all available space at the headquarters is utilized and in fact much of the space is very overcrowded.

The strength of NCEE is enhanced by the outstanding efforts put forth by the committees and the chairmen of the committees. The UEQ Committee is closely allied with our registration procedure. John C. Von Kaenel has worked with that committee and his efforts are greatly appreciated. John also has enhanced the position of NCEE in the academic world, and his contacts with engineering students who are members of Tau Beta Pi will result in dividends. We express to John and Sallie our thanks for inviting us to their home on many occasions when committees are meeting at Clemson.

The morale of the Council staff is excellent. This also includes our consultants, item writers and graders. I express to each of them my thanks and appreciations. As we discuss staff I am reminded of the efforts put forth by Roger Stricklin. He is ever ready to assist anyone involved with NCEE. His work week has no limitation as to days or hours. I personally thank Roger for his efforts in pointing out to me the path that makes our tasks enjoyable, and thanks to Joyce for her interest in our behalf.

I am joined by Alice in thanking the members of the Council for presenting to us the opportunity to serve the profession of engineering. The board of directors supported us in every occasion. We wish for Harry Parker the same support we have received. He will become deeply involved in the Council's affairs and will establish a record difficult to follow. To Kitty and Sam Wainwright, thanks for pointing the way and for always being ready to work for NCEE. We tried.

President's Report—1987
J. Harry Parker

Fellow members, associate members, and emeritus members of NCEE. It is customary for your officers to prepare an annual report of their activities in coordinating the services of the Council for its member boards. Each report reflects the style and substance of the areas of responsibility of the individual preparing the report. My report to you will be somewhat different in that the following pages of your annual proceedings report in detail the actions taken on your behalf by the Board of Directors and the committees of NCEE in doing the work of the Council. We take special note of the invaluable assistance of your executive director and the dedicated members of his staff.

We promised you a year ago that we would make 1986–87 a year of communication between the Board of Directors and staff and the members of the Council. We have tried to make this an informed Council. We hope you agree that these efforts have been successful. We have done that in our letters to the Boards, our reports to the committees and our reports and discussions at the zone meetings. I now commend to you the reports of my fellow officers, the standing committees and two AD HOC committees of NCEE for 1986–1987 whose overwhelming response to the charges given to them this year has resulted in recommended actions that will enable the Council in coming years to better meet the increasingly more vocal challenge from the public for protection of life, health and safety in the practice of engineering and surveying. I am extremely proud of the efforts of my fellow members of the Board of Directors, the Chairmen and members of the committees, Executive Director Roger B. Stricklin and his staff, and all of you who have supported our efforts this year to

make the registration process a more meaningful one in its commitment to the welfare of the public. Your deliberations and actions at this annual meeting will be the test of how well we have succeeded.

President's Report—1988
Dennis F. Meyer, P.E.

Each administration is an opportunity to recognize new Council opportunities and the continuation or ending of existing programs. Activities of Registration Board Members from across our nation, NCEE staff, state boards' staff, subject matter experts and consultants for the 1987–88 fiscal year are being recorded for history. Impacts of these contributions to our profession by each person cannot be adequately acknowledged with a simple thank you. My gratification for the time and talent contributed by each must, in greater measure, come from observing the successes of our examination program.

The privilege of serving as your president has provided me with many memorable opportunities to meet the most sincere and hard-working group of people in America, to witness the interaction and cooperation between committees, to observe the strength of examination processes (which may be challenged occasionally, but are respected by professionals far and wide) developed by dedicated professionals interfacing with the examination preparation staff, and to interact with academic, technical and professional societies. I am fully aware of the variation in comfort levels our members have in dealing with external professional activities. These external relationships, when carried out on behalf of NCEE, can and should continue as each one considers appropriate in accordance with NCEE policy. Past President Sam H. Wainwright (1985 NCEE *Proceedings*) observed: "a change which began a few years ago has continued to move the Council's attention away from complete concentration on the examination process to a broader study of the total registration system. Education and experience qualifications, as well as examination qualifications, need in-depth study in order to develop interrelated standards for admittance into the registration process."

I'm very happy that today we continue to develop these relationships within our profession. These activities take precious time and resources, but our profession is entitled to have its best minds available, attending to our professional concerns. It is appropriate that NCEE people make these contributions.

Education is the foundation of our profession. Academicians bear much of the responsibility for developing the minds of our students into functioning professionals who will go on to challenge the boundaries of current technology. Professional and technical societies contribute much to the social, economic and professional concerns of our profession. We on state boards are charged with enforcing registration laws to ensure that engineers and surveyors practice in a manner that protects the safety, health and welfare of the public. These three dimensions of our profession: academia, societies and state boards (NCEE), discharging responsibilities appropriate for each and cooperating on concerns common to our profession in general, assure the public and our profession the most dynamic professional services.

This scenario is not used in all technically developed countries, but it is working well for us. I respectfully acknowledge that Dr. Russell Jones, President of ABET, has proposed the elimination of the Fundamentals Examination for an Engineer-in-Training who graduates from an ABET-accredited curriculum. Dr. Jones proposes also that all working engineers be grandfathered to registration and the industrial exemptions be eliminated. We continue to believe that the best

interest of our nation and our profession is best served by building on our current professional structure. A scenario that would allow engineers currently employed to continue working in present positions as non-registrants but requiring all newly hired engineers to become registered does have support. This would effectively eliminate the industrial exemption and would not grant current engineers privileges they do not now have.

Engineering specialty certification was discussed in detail at Atlanta in April. Objectives and benefits of certification were defined. NCEE opposes certification if used in lieu of registration. Certification should convey to the public special credentials that are earned from an advanced body of knowledge that professional engineers possess. It should not provide a vehicle for those who find professional requirements as defined by state statutes more rigorous than their body of knowledge can support. No classification should be promoted that will mislead the public regarding credentials of anyone in the engineering or surveying profession. The time is approaching when Professional Policy 7 needs to be rewritten to reflect a positive and precise scenario. The burden of showing the need, formulating the content and administering a testing program for certification should remain with the practitioners.

Continued education as a component to be considered as a part of continued competence has been discussed for a long time. Professional Surveyors are moving in the direction of mandatory continued education. Engineers have been using the terms "continued education" and "continued competence" interchangeably. Engineers seem to be focusing on continued competence, recognizing the engineers are being served well by academia, technical and professional societies that maintain voluntary and rigorous training programs. These people contribute a great deal to our profession. I commend them for their efforts and believe they are successful. When something is working, don't fix it.

Nearly 80,000 engineers graduate each year, slightly more than 20,000 become registered. The accidents at the space fuel plant in Nevada and the refinery in Louisiana should call our attention to standards addressed by groups who are predominantly unregistered. It would seem that our most urgent professional activities should include registration of all engineers engaged in activities of an engineering nature.

The 1987 Annual Meeting approved actions to reorganize the Uniform Examinations and Qualifications Committee. Examination committees for engineers and surveyors continue to develop examinations. The Examination Policy and Procedures Committee develops and/or coordinates policies which affect examination development. The Examination Audit Committee is moving cautiously and deliberately to set a course of action. All should be proud of their first year's efforts. We need to keep in mind that the Audit Committee's activities are extremely sensitive and it may be inappropriate to publish its deliberations until they are final.

The inclusion of three objectively scored examination items in the A.M. and P.M. sections of each Book I discipline plus the economics item became a reality in April 1988. The first administration revealed a need to improve our quality control and to provide more lead time for item development and review. I'm optimistic that actions already in place can do much to affect these changes, that we are going in the right direction and that we will succeed.

Changing from an eleven-point to a six-point scoring plan is giving item writers increased opportunity to develop items that respond to test specifications within the desired time constraints. The experiment that eliminated references to numbers by scorers added substantially to staff work time and delayed getting scores back to states. This method did not work as well as originally anticipated and is now history.

During the 1987 Annual Meeting, the Council approved a motion to establish a position for an individual that would compare foreign curricula to ABET-equivalent programs. Many questions have been raised on precisely what this individual would do. What kind of a financial commitment this activity entailed, what specifically do states need or want. The International Relations Committee recently surveyed states to obtain information that would provide direction for action. Thirty-four states answered the questionnaire. Twenty-two states are using NCEE's Foreign Education reports. Fifteen states are satisfied with NCEE's evaluation of non-ABET transcripts (Foreign Education pamphlets). Those who are not satisfied with current levels of effort by NCEE indicated that:

NCEE should hire a consultant as per resolution 2 states
NCEE should update Foreign Education reports 3 states
NCEE should develop unspecified assistance 2 states

With increased computer capacities that will serve law enforcement activities comes available capacity to serve curriculum evaluation, both non-ABET domestic and foreign curriculum. The process that Michigan has initiated utilizes a committee of registered academicians as consultants to the board to evaluate transcripts. This procedure is very powerful for several reasons. First, it utilizes the most knowledgeable people in our profession. It allows professionals who have an opportunity to observe the performance of individuals coming from foreign institutions when they choose to work for advanced degrees. It gives our profession an additional area in which professional cooperation can occur. In summary, additional computer capability, new efforts by the International Relations Committee and continued definition of needs by each state will permit a basis for a more informed decision. Thank you for your patience, but the delay will be beneficial to all.

The Professional Activities and Requirements Analysis for engineers continues but has slipped several weeks. An interim report will be presented during the Annual Meeting. Completion of the project should come at approximately year's end. The analysis is comprehensive; it includes evaluation in four specific areas: professional activities, areas of practice, professional requirements (knowledge, skills and abilities) and professional participation plus background information. Cooperation by societies and dedicated committee members are making this task a quality evaluation that will be valuable for future planning.

A special Surveying Examination Workshop was held in June to evaluate the equating, scaling and psychometric monitoring of the April 1988 examinations. They include Fundamentals of Land Surveying, Parts 1 and 2; Principles and Practice of Land Surveying, Part 1; Principles and Practice of Land Surveying, Part IIA (Public Domain) and Part IIB (Colonial). It appears with greater frequency surveyors are predicting the Public Domain and Colonial examinations can be combined.

On October 1, 1987, John C. Von Kaenel retired. We all wish John and Sallie a most happy, healthy and successful retirement. We thank them for their personal and professional contributions to Council efforts. J. Earl Herndon has assumed the responsibilities of Director of Examinations. Earl is personable, hard working and highly qualified. Lorraine Cauthen retired as Director of Administrative Services on January 1, 1988. Best wishes to her for a happy and healthy retirement. Beth King has assumed these responsibilities and is doing her usual good job. Presentation of professional certificates enhances the professional image of recipients. I hope that each state who can feasibly make a formal presentation will do so. This is one of several actions that can be used to develop professional pride.

It has been a privilege to serve as Council president, to see our committee chairmen and members share so generously of their time and talent. To Roger Stricklin and the entire Council staff for their support of our activities, thanks.

Bev and I have enjoyed working with Council members and staff on Council activities and travel the past two years. We appreciate their friendship, support and patience. The combined actions of each person have provided the force needed to accomplish our task successfully. My thanks to the Board of Directors for their dedication and support during this very busy and most enjoyable year. I shall do everything possible to assist incoming President Kimberling, the Board and the Council on a continuing basis.

If there are no objections, this report is received for printing.

President's Report—1989
Charles L. Kimberling, P.E., L.S.

This has been an exciting, challenging and rewarding year. All committees have performed effectively and efficiently through a coordination of efforts in addressing their charges. This will become evident as each committee chairman presents his committee report, as printed in the *Pre-Convention Reports*. I encourage you to thoroughly read each report before the Annual Meeting. The committee recommendations will be considered and will impact Council decisions and the future role of the Council.

To the committee's chairmen and members, I express my personal and the Board of Directors' sincere appreciation for their support in performing the charges assigned as a professional team.

The Council in August 1988 looked to the future by approving an expansion of the headquarters building. Bids for the expansion, as approved by the Building Committee of the ACCA and the Executive Committee, were received on May 15, 1989. The award authorized execution of the construction contract in the amount of the base bid of $857,664 and nine alternates in the amount of $17,680 making the total contract for $875,344. The Board of Directors, on recommendations from the Building Committee, also approved for this year's budget $31,000 for carpet for the existing building and new building and $50,000 for office furniture. The contractor has indicated that the building expansion will be completed within approximately eight months.

The personnel committee of the ACCA reviewed the current staffing of NCEE and concluded that within the next five years the Council may need seven additional employees. Two of these positions, Technical Assistants to the Director of Examinations, were hired effective April 3, 1989. The Board of Directors or a personnel committee should review staffing requirements very thoroughly on an annual basis to determine the true need before any additional positions are created. Just because space in the expanded building will be available, this is not justification enough to create and fill new staff positions. The Board of Directors, after a thorough review, approved a complete update of the Employee Manual and job descriptions.

The excellent efficiency of the Council operation is attributed to the management ability of Roger B. Stricklin, Jr., our Executive Director, and the dedication and loyalty of the staff. I express to all of them my appreciation and thanks.

The financial condition of the Council is excellent at this time. However, the five-year projections indicate that expenditures will need to be closely monitored and revenue increased if the Council's reserves are expected to remain at a satisfactory level for the next five years. The fees for examinations may have to be increased within three to five years to avoid a deficit.

The morale of the staff is high even though some offices are crowded. The space problem will be solved on completion of the expansion.

Since a dialogue has started between the Accreditation Board for Engineering and Technology (ABET), the National Society of Professional Engineers (NSPE), and the Council, it has become evident that many activities are occurring between organizations that affect professional engineers on a worldwide basis. NCEE must continue to monitor these activities to insure that the rules of state boards are identified and properly represented. By monitoring these activities NCEE should be able to establish a proactive posture instead of reactive to actions of other organizations. Discussions and actions are occurring by ABET, NSPE, and NCEE with the following organizations:

- The Institute of Engineers, Australia
- The Canadian Council of Professional Engineers
- The Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers
- Canadian Council of Land Surveyors
- Canadian Institute of Surveying and Mapping
- The Institution of Engineers of Ireland
- The Institution of Professional Engineers of New Zealand
- The Engineering Council of the United Kingdom
- Pan American Federation of Engineering Societies
- The European Federation of Engineering Associations
- Royal Flemish Society of Engineers-Belgium
- World Federation of Engineering Organizations
- United Nations Educational and Scientific Organization

Of particular note is the Council's participation in discussions with our Canadian counterparts regarding the U.S.-Canadian Free Trade Agreement (FTA). We recently met with several Canadian land surveying organizations and we will meet with the CCPE in July. At the Land Surveying Forum, the American Congress of Surveying and Mapping and the Canadian Institute of Surveying and Mapping selected to jointly identify problem areas and possible solutions.

I believe our engineering examinations are at the threshold of dramatic and significant developments. I enjoin you to be prepared for discussions on the following topics:

1. Discipline exams vis-à-vis combined exams.
2. Uniform examination dates.
3. Increased use of machine-scored items.
4. Zero choice examinations.

One of the highest honors that one can receive is the opportunity to serve his chosen profession. It has been a privilege and honor to serve as Council President. The Board of Directors and members of the Council have provided support on every occasion. It's enjoyable working with a professional team.

Joyce and I appreciate the opportunity to meet and work with the members of the Council and their spouses. We certainly appreciate the courtesy and kindness extended by the staff, Joyce Stricklin, and Jackie Herndon.

I appreciate the opportunity I've had to work with President-Elect Dave Sellards. I'm proud that we worked as a professional team. Joyce and I wish for Dave and Alice the best during his tenure as President. I'm confident that each of you will give your support to President-Elect Dave Sellards. He will be an outstanding President of NCEE.

President's Report—1990
George D. Sellards, P.E., L.S.

I started out with good intentions. In fact, back in Albuquerque, NM on August 12, 1988, when the Council elected me to the office of President-Elect, I had great expectations. I thought it would be possible to get rid of the federal exemptions. I thought it would probably take congressional actions—but I thought we could do it. Each of us must know one or more in the House or Senate. Surely, we could convince our leaders of this need to further protect the public. "I'll get this organized in time," I thought, "but first I must learn how to be a President-Elect."

I was fortunate. I had the best training possible and President Charles Kimberling gave me every opportunity to learn, participate, and get involved. I thought, "I better try and learn how to run the Council and then…the federal exemptions."

Roger Stricklin was amazing. He taught me lots of things the first year: all about Council policy, what was expected of me, how to be humble, and how to be humble again. I learned how helpful all the Council staff would be and how you could count on them to bail you out of jams. They corrected my spelling, grammar, and other weaknesses I've demonstrated over the years. In fact, Roger helped me with most everything except how to find a car in the parking lot in some strange city.

As President-Elect, I chaired the Council for International Engineering Practice. That gave me contact with the Accreditation Board for Engineering and Technology (ABET), the National Society of Professional Engineers (NSPE), as well as our counterparts from Canada. "Good Training!" I thought, "It should help me politically with the federal exemptions." But that would come later.

First, there were committee meetings to attend. Then more committee meetings and even more and more. "Keep traveling," my daughter said, "I need the frequent flyer points."

The committee meetings were many. My opportunities to learn were exciting. I had worked on the land surveying examinations before, but not the engineering examinations. Chairman Bob McClure was amazing. He and his workers did wonders with the examinations. They even tried to teach me how to write multiple-choice items for the Principles and Practice of Engineering examination. In addition, I learned just enough about psychometrics to become dangerous. The worst part was that it distracted me from my goal of attacking the federal exemptions.

Charles sent me to a few meetings to practice my speaking skills. But it was apparently not enough, as I'm still practicing each chance I get.

As the Christmas holidays arrived, I figured I could organize a campaign on the federal exemptions. Little did I know that my toughest duty was ahead. Yes, my toughest duty was to assign our members to the NCEE committees for the next year. (It was still NCEE in those days.) If that wasn't enough…I was responsible for the charges also! Well, I'm not going to comment much more on that effort except to say, "I did a wonderful job."

I know I did a wonderful job after having watched the committee members perform and after reading their reports. You will also be pleased when you read and hear of the many accomplishments.

Well, in time my year as President-Elect passed. Charles taught me all he could. Roger kept teaching me to be humble.

I was 'one very proud person' when Charles gave me my President's pin at the banquet in Point Clear, Alabama. (And I liked it even more when I gave Charles his Past President's plaque.) "Now, I can call all the shots," I thought, "and make all the important decisions, even get rid of the federal exemptions." All I had to do was be humble!

I really didn't get off to the right start…things just kept happening. Except for the few silly people with pig noses and funny mustaches, our people kept doing their duties. All those duties involved discharging their responsibilities as board members—attending meetings, preparing examinations, performing examination audits, law enforcement, communications, and all other things required in the protection of the public.

Oh, yes. As most of us did, early in my term as President, I almost forgot that NCEE doesn't exist anymore. When invited to speak at various national meetings I liked to tell their delegates the following:

> Our members at our Annual Meeting in August 1989 voted to change our name. We are now known as the National Council of Examiners for Engineering and Surveying. For those of you who knew us as NCEE—we made the change easy. Now, we are NCEES.

I liked telling them that we made the change to better recognize the efforts of all our members in discharging their duties in regulating the practice of both engineering and surveying.

Being the President of NCEES is kind of like being a caddie for all the top golfers at the Masters. Just as the caddie gets to suggest a club to use or the grain on the green, the President gets to suggest an idea here and there. At the Masters the professional golfers do the work and here at NCEES the members, the real professionals, do the work.

Hey! What about the federal exemptions? What happened? Well, I'm not really sure. Maybe the rest of the job got the best of me. Maybe I just didn't have what it takes. Maybe it just takes longer than I thought or just maybe we'll begin to pick up interest and go after it.

So what's ahead? We have the Annual Meeting coming up. It will be a good one and we will address some important issues. Combined vs. discipline examinations, international involvement, education, experience, and examinations, are just a few examples.

I urge you to read this *Pre-Convention Reports* and come prepared to make some wise decisions. But I urge you to do something more.

One excellent decision was made last year. John Lyons was elected to 'carry the ball' for you next year. That excellent decision was demonstrated to me again and again this past year. John, probably, comes to the presidency with more experience than most of us combined. You will enjoy John's ideas, his style, his decision-making capabilities, and his techniques in teaching Roger to be humble. Yes, we are in good hands for the coming year.

Now, as a sideline to my report, I want to share with you my last "Dear Dave" letter. It goes like this:

> Dear Dave:
>
> I'm not admitting that you had any success in your job as President of NCEES. However, you did get elected and so far you haven't been impeached. To what or whom do you credit this phenomenon?
>
> Signed:
> U. Sure Fooled Me

Dear Me:

I really did fool you, didn't I? The Council really didn't elect me to this job. The person they really wanted was my wife, Alice. They figured anyone who could live with me, work with me, and put up with me could do about anything—maybe even get rid of the federal exemption.

Signed:
Dave (A lucky person)

President's Report—1991
John E. Lyons, P.E.

A year ago today I was President-Elect of this great Council. That is a way of saying that I was involved in an "on-the-job training program." I was just completing a year of traveling with Dave Sellards and Roger Stricklin, attempting to learn what the President does; why he does it, and where, and when, and with whom. And guess what? They must have been great teachers because here we are a year later and the Council has survived and prospered while I have been President! Much of the success of my Presidency continues to be attributable to two people. Dave, in his capacity of Past President, continues to provide advice and counsel. And Roger is always there pointing out priorities, covering details, and managing our day-to-day operations.

I can remember telling everyone when I accepted the Presidency last August, that the Council was in good shape and that I subscribed to the principle that "if it ain't broke, don't fix it." Well, I have not been able to hold strictly to that adage. I haven't been able to resist trying to do a little "shoring up here and there" as the need seemed to arise.

All in all, things are going very well with the NCEES. We have some matters of concern which I will address before completing this report. But first some positive comments are in order. One of my earliest functions as your President was to preside over the dedication of the additional space added to our office in Clemson. This building addition, planned and brought along by Past Presidents Kersich, Kimberling, Sellards, and Wainwright almost triples the available space for Council operations. It is now possible to have two or three committees meet at Clemson simultaneously without disrupting the work of the staff. The dedication ceremonies were simple, but impressive and fitting for the occasion. It was especially nice to renew acquaintances with so many of our Past Presidents who were in attendance.

Last year at this time, I was finalizing the makeup of our various committees. This is probably the most important duty of the President-Elect. Our committee structure is the very heart of NCEES operations. Apparently I had the benefit of divine guidance in my selection of chairmen and in the assignment of committee members. While sitting in on committee meetings over the past months, I have regularly been impressed with the fact that we have so many capable, high level professionals willing to work so hard without compensation other than the satisfaction of contributing to the Council. I want to thank all of you who have served so willingly and with such dedication during this past year. For those of you who are reading this, I trust that you will continue reading the *Pre-Convention Reports*. Study the recommendations made by the various committees, and be prepared to vote on such actions as are brought up at the Annual Meeting. Remember, you are the Council. Your Board of Directors, committee chairmen, and staff people can only recommend. The final actions are up to the Council.

Our examination programs are proceeding well. Those people serving on the examinations committees are doing an excellent job of interpreting the task analysis, developing a larger percentage of machine-scorable problems, maintaining defensible examinations, and procuring additional item writers. Examination security problems surfacing in several states have necessitated maintenance of a larger item bank in order to quickly assemble backup examinations.

We have just completed the 1991 zone meetings. It has been my pleasure to address each of these meetings formally. More importantly, I've had a chance to chat with many of you informally, and that's one of a President's greatest joys. And of course, enjoyment of the entertainment during the social functions of these meetings cannot be denied. Even in those cases where I have been set-up to join such entertainment, i.e.—singing at the mike with the entertainers and demonstrating my non-proficiency at hog calling!

In addition to attending our zone meetings, I have represented the Council at several meetings with other professional, technical, and governmental groups with whom we interface; groups such as NSPE, ABET, NCARB, CCPE, and others. I have attended the meetings of CIEP with the Canadians in discussions relating to the Free Trade Agreement. Attending the summit meetings sponsored by both ASCE and NSPE have been particularly stimulating since these were roundtable-type discussions. I was especially happy to be invited to attend a White House Press Briefing wherein President Bush accepted a nine-foot long scroll on which our name, together with forty other engineering groups, was inscribed. This was in support of the National Coalition of Engineering Societies for Precollege Mathematics and Science Education.

It is interesting to note two things relative to the above travels. One, each time I swung by the house for a change of clothing, my son's dog still recognized me. Two, on most of the above trips, my bag traveled to the same city on the same plane as I!

A highlight of my Presidency was the State Board Presidents Assembly of the chairmen/presidents from fifty-two of our Member Boards in Kansas City. This meeting is well covered in the *Registration Bulletin* which I presume you have received by now. Suffice to say that I hope we can justify the funding of a similar assembly again next year.

Early in this report I mentioned that there are some items of concern which we must continue to address. These have no quick and easy solutions and they will not just go away. First is the "federal exemption" which Dave Sellards had hoped to dispense with last year. Second is the proposal advocated by some influential engineers to change, through politics, the laws under which we license professional engineers. In particular, elimination of NCEES examinations is being advocated by some. A third concern is the certification of engineers. Another concern is easier reciprocal licensing, not only between our Member Boards, but with other countries. Since our minimum requirements for licensure are generally more stringent than in much of the rest of the world, we have pressures to face here.

As the political sector continues to negotiate a "free trade agreement," they may also attempt to mandate changes in our laws. We must therefore continue to be politically astute in this area if we are to continue to protect the life, health, and property of the general public through the regulation of the practice of engineering.

A concern, of course, is money. The Council is in good financial condition at the moment. However, we have seen the cost of many items escalating and have taken steps to avoid over-spending our budget. Our Executive Director is a good manager and is closely monitoring expenses. He is aided in this effort by our Treasurer Alfred Bolton and the Committee on Finances Chairman

L. G. "Skip" Lewis. The budget being proposed by the Committee on Finances for next year is lean, and scaled to keep us in the black.

Other concerns will continue to arise and I will pass them, together with the above, along to William Karr, our soon-to-be President. During recent months I have endeavored to assist Bill in learning the who, what, where and whys, just as Dave Sellards did for me. I am sure Bill will provide us with very capable leadership in the next year.

It has been one of the greatest satisfactions of my life to have been allowed to be your President during this year. The friends I have made, the cooperation received from my fellow Board members and from you, Roger and his staff—it has been great!

President's Report—1992
William L. Karr, L.S.

How does one describe being President of the NCEES? To be allowed to serve this Council and interact with its members and staff in this capacity is indeed an honor and a "once in a lifetime opportunity." Thank you.

We, as a Council, are extremely fortunate to have a very qualified, dedicated staff to handle our day-to-day affairs. Many days it seemed as if my personal office was located in Clemson due to the conversations, faxes, and correspondences received and sent. Being kept informed and up-to-date on Council problems and issues is important to me. Our staff, especially Roger, did just that.

It has been an exciting year for the Council. A number of on-going projects were wrapped up, and several new projects started. One that should be of considerable interest to Council members is our FE Review Committee. As I reported at the zone meetings this spring, this committee, chaired by Charles L. Kimberling, P.E., L.S., met three times with members of ABET, ASEE, NSPE, and the Deans' Council to talk about the FE examination: how it is constructed, graded, and used. Future content and potential uses of the FE examination were also discussed. The creation of a joint task force made up of representatives from each of these organizations is most significant in that a continuing framework for interaction has now been established. The work of this joint task force over the next 18 to 24 months will be of vital importance to the Council and our Member Boards.

Another area we should talk about is examination usage. We again experienced a significant increase in the use of all of our major examinations. In the face of declining college enrollments in the field of engineering, this increase is certainly good news. Whether this is from better promotion of our examinations and their benefits or from students and professionals trying to better position themselves for the job market, it does not matter. Usage is on the upswing, and that is encouraging.

Our Records Verification Program is thriving also. I have personal knowledge of that from the periodic writer's cramp I get from signing the wall certificates. As you may be aware, we passed the 10,000th Council Record mark recently, and at the rate we are going, 20,000 will be here shortly. With mobility becoming such a hot issue, the Records Verification Program should continue to grow at an astounding rate over the next five years.

We had an interesting year with USCIEP. While we were able to agree on a number of issues and signed an interim agreement, we still have a long way to go. Examinations are a key stumbling block to a final agreement. While many feel frustration in the slow progress being made, bear in mind that this final agreement will most likely be used as the starting place for all other international agreements the Council will be involved with. And speaking of international affairs, you may be aware that we met this past winter with representatives of the Mexican

registration community. We had a very productive meeting and exchanged a lot of information. The groundwork is now laid for future discussions. We also had inquiries from Russia and Japan about the use of our examinations in their respective countries. Japan is very interested in establishing a registration process based on examination similar to ours. I should have a more complete report for you at the Annual Meeting.

And now to committees: you folks are amazing. I am constantly surprised (and I shouldn't be) at how the committees settle in and focus on (attack is a better word) their assigned charges. I would like to thank those who gave me advice last year when I was President-Elect regarding the appointment of committee members and committee chairmen. In every case you were right, and you know who you are. The committee chairmen worked hard to prepare for their meetings, and in many cases the committees began to function in late August. All in all, we had an excellent year with regard to committee work and much was accomplished. Congratulations to each of you.

I want to touch briefly on the activities of just a couple of the committees. While examinations and the examination committees are the life blood of the Council, the Committee on Finances stands out. Chaired by L. G. "Skip" Lewis, Jr., P.E., (by the way—Skip, I do know what L. G. stands for) this committee has made a number of significant recommendations based on a thorough understanding of the current and projected fiscal conditions of the Council. While talking about finances, we continue to have a budget in the "black" for 1991–1992. Based on a projected margin of $500 last August, a revised margin projection from our January Board meeting of $50,000 looks pretty good, and that is conservative. I want to express my thanks to many of you, and in particular Treasurer Steadman, for his many ideas in cost containment and revenue enhancement. It is working.

The Surveying Education Committee, chaired by Peter M. Jorgensen, P.E., L.S., came up with some interesting results. While not quite what I expected, I definitely support the approach they are taking. Pete also chaired the EPP Committee; their motions will clarify or change a number of Council policies, and their report should be read carefully.

Another hot topic that will come up during the UPLG Committee report is continuing professional competency. I am sure everyone has an opinion on this, and it is sure to be a much-debated topic at the Annual Meeting. Haunani S. L. Kekuna, P.E., chaired this committee. The UPLG Committee and Haunani are to be congratulated on the fine job they did, on short notice, with this issue.

Lastly, I would like to turn to the Board of Directors. I have never served with a finer group of individuals and doubt if I ever will again. They have been supportive, combative, contrary at times, and never afraid to say what they felt was in the best interest of the Council. They all are leaders in their own right (so much so that I've had to use a sledge hammer on more than one occasion to regain control). But above all else, they have been friends. They have represented you well and have contributed significantly to the successes achieved this year. I have been especially fortunate to have Immediate Past President John E. Lyons, P.E., as a counselor. As John leaves the Board this year, I want to personally thank him for all the help and guidance that he has provided.

In looking forward to next year, I have gotten to know President-Elect Paul Taylor quite well. He is well organized for the 1992–1993 year, and the Council is in good hands. He even managed to pick up some new jokes through the year. Paul, best of luck next year.

In closing, I would like to say to each of you, thanks for the many conversations, words of support, guidance, and assurances. It has been an honor and a privilege to be a part of this Council and especially to be your President. I hope that I have contributed, I certainly have tried my utmost. Thanks again.

President's Report—1993
Paul Taylor, P.E.

Dear friends and NCEES colleagues, this report covers highlights of 1992–1993 activities.

We have made some very significant strides that bode well for the future of the NCEES. These include the work on very significant changes in the FE examination, the strengthening of Council finances, and the completion of the special audit of Council activities.

The FE Task Force was started last year under Past President Bill Karr. This is a group of two representatives from each of the five organizations: NCEES, ABET, NSPE, ASEE, and the Engineering Deans Council. The purpose of the group is to prepare a new FE examination that is still suitable for engineering registration, but also more acceptable to the other organizations, particularly the engineering deans. Due to the outstanding work of our NCEES representatives, Robert W. McClure, P.E., (who is chairman of the group) and Kenneth A. McCollom, P.E., the group has made tremendous progress to date. Southern Zone Vice President E. Walter LeFevre and President-Elect John W. Steadman have also worked with the group. Based on results from a survey from engineering deans and members of ABET's Engineering Accreditation Commission, the group is now visualizing a new FE examination that would include some engineering discipline questions as well as fundamentals questions. This work and the outcome of the new FE examination is one of the most important issues of the NCEES.

As you recall, at the end of the 1990–1991 fiscal year, the Council had a $202K deficit. I am pleased to be able to report to you that the NCEES has turned the corner on finances. This is due to the vigorous efforts of the Board of Directors, the Treasurer, the NCEES staff, and the Committee on Finances to cut costs and increase revenues. As a result of these efforts, we have gone from a $202K deficit in August 1991 to a $148K surplus in August 1992. Further, the first half results for the year 1993 look even better.

The Member Board Chairmen Assembly, at Fort Worth, based on feedback from the forty-nine delegates, was an outstanding success. Each delegate was provided an opportunity for thorough presentation and each of us learned very valuable information from each other. The NCEES Board is presently considering: 1) annual vs. biennial; 2) other possibilities at Annual Meeting and/or zone meetings. I want to express my appreciation to Past President Karr for co-chairing this event with me.

A special committee chaired by Past President John Lyons has conducted a quality assurance audit of Council activities. An outside management consultant was engaged to perform a management study aimed toward improvements where appropriate. The study has been completed and the special committee made recommendations to the Board of Directors. Most of these recommendations are being implemented. You will have the opportunity to vote on proposed constitution and bylaws and policy changes.

The Participating Organizations Liaison Council (POLC) meeting in Salt Lake City was well attended and was considered to be excellent. A highlight was that these professional and technical societies agreed to publish articles promoting examinations and professional registration in their respective newsletters. J. Carroll Hastings, Chairman of the Committee on Communications and Publications, was present to provide articles for the representatives to carry forward for publication.

Interprofessional Council on Registration (ICOR) consists of the NCEES, NCARB, and CLARB. Its purpose is to enhance cooperation between the design professions represented by each organization. Working relationships between the NCEES and NCARB have been strained during the past year, primarily as a result of NCARB's national issue of a "Handbook for Code Officials."

This handbook implied that design of buildings for human occupancy was the exclusive domain of architects as opposed to engineers. We are making a last ditch effort to reach agreement on a mutually drafted ICOR report that establishes guidelines for working relationships between engineers, architects, surveyors, and landscape architects.

I want to express my most sincere appreciation for the opportunity you have given me to serve as your President. During the year, I have gotten to know some of you a lot better. I believe the most rewarding part of this experience is the reinforcement of my convictions that NCEES members represent the "cream of the crop" with regard to the quality of people in our professions.

I have been extremely privileged to serve in between two outstanding leaders, Past President Bill Karr and President-Elect John Steadman. They have made me look good by association.

Also, I want to thank my Board members: Treasurer L. G. "Skip" Lewis, Jr., and Vice Presidents E. Walter LeFevre, Leon H. Clary, George A. Brizendine, Jerry L. Day, and more recently Warren L. Fisk. To tell you that we always agreed on every issue would simply be untrue, but we were able to disagree without being disagreeable; the bottom line is that we got the job done. Thank you sincerely.

Finally, I want to thank the NCEES staff for their vigorous and unfailing support during the year. Most of my contact has been with Executive Director Stricklin, Beth King, and Pam Powell. Thank each of you for doing everything possible to make my term successful.

President's Report—1994
John W. Steadman, P.E.

This has been a very exciting year for the NCEES as we have tried to respond to the changing nature of the practice of engineering in a global economy and plot a course for the Council in the next century. Examining the issues associated with NAFTA and the requirement for eliminating barriers to the provision of engineering services in North America, the possible use of the NCEES examination in Japan and Palau, and major changes to the content and purpose of the Fundamentals of Engineering (FE) examination have all provoked controversy and debate within the NCEES. Fortunately, even though the debate has sometimes been heated, it has been constructive and productive. It has provided useful suggestions on guidance of the Board of Directors as we wrestle with the issues and put together a strategic plan for the Council to consider, modify as needed, and act upon at the Annual Meeting. I want to thank all of you, whether you were for or against the proposals presented, for your thoughtful assistance during this year as we addressed difficult and complex issues. Special thanks to President-Elect Clary and the entire Board of Directors, whose dedication, commitment and competence cannot be overstated. This report attempts to summarize my current perspectives on these major issues as well as a brief summary of other items of importance of the Council.

The most controversial issue is the proposed Memorandum of Understanding (MOU) with the Japan Technology Transfer Association. In contemplating the many letters, phone calls and personal comments I have received, it seems to me that the purpose of the MOU needs to be kept at the forefront of this discussion because otherwise ancillary and emotional concerns tend to distract from clear thinking about the problem at hand. The MOU provides only for the sale of NCEES examinations to JTTAS for their use in establishing a system for licensing of professional engineers in Japan. In my opinion, this is only a tentative step in what would become a very long process. There may not ever be a second or third step. That is yet to be seen. However, the MOU, as written, protects the interest of the NCEES, the autonomy and authority of the Member Boards to license

engineers in their jurisdictions and the security of the NCEES examinations. While no one can predict what will happen in the future, I think that two very important advantages could come from proceeding with the agreement. First, if JTTAS succeeds in establishing a PE licensing system in Japan that is similar to ours, we would someday be able to address reciprocity issues without the problems we now face with Canada where they do not use a similar set of examinations. Second, since many of the companies which support the JTTAS effort have operations in the U.S.A. as well as Japan, the agreement has the potential to provide another element of leverage for our efforts to end the industrial exemptions. We have endeavored to protect the interests of the Council and our Member Boards in every way possible. I have reviewed the concerns expressed by both individuals and Member Boards. I realize that this would be a new initiative for the NCEES and that anything new has its risks. However, I believe that the language of the MOU minimized the risk and that the potential benefits are very important, so I recommend that the MOU be approved.

A related and also controversial issue is the proposed amendments to the Constitution and Bylaws that would provide for some form of membership of international organizations in the NCEES. As you know by now, the proposed changes would provide for either regular membership or foreign membership which would be without vote. Some of our committees have recommended approval of both forms of membership so that the Council will have the ability to approve requests in either category. Of course in either case, an organization seeking membership would have to be approved by a majority vote of the Member Boards. While the Board of Directors has not yet taken a position on the changes, my personal preference is for approval of the special category for foreign members. I think this preserves the fundamental nature of the NCEES as representing the U.S. bodies that license engineers and surveyors while providing for increased communication and participation by licensing bodies in other countries. In fact, I can see the time that we might form a committee that would be like our POLC which would focus on those areas of concern in international engineering practice and formulate recommendations for Council action. Eventually, it may become appropriate to make the other change that would provide for full NCEES membership by foreign licensing bodies, but I think it equally possible that a new international coordinating group may arise that would make such membership superfluous. Should the time come when there was a real justification for full Council membership by foreign boards, a new C&BL Committee can consider the proper implementing language.

Another item that deserves your careful attention is the report from the joint task force on changes to the FE examination. The suggested new format for the FE examination would surely make it more suitable as an outcome assessment tool. This proposal is also quite controversial, both within the Council and with other groups, notably the engineering deans. There are certainly some challenges associated with implementing the proposed changes, should you approve them. However, I am convinced that we have the resources, both financial and human, to accomplish the task. Remember, though, that the human resources are predominantly volunteers and we have to adopt a realistic timetable with that constraint in mind. I urge you to also think about the possible long-term implication of these changes for the very model we use in the U.S.A. for licensing engineers. I believe that the proposed discipline examinations could be the basis for a new paradigm which could help us build a better approach to ending the industrial and government exemptions.

I have made a concentrated effort this year to improve our relationship with other engineering and surveying organizations, including NSPE, ASCE, IEEE, NSPS, AAES, ACEC, AAEE, and others. I

think we have made some progress in the right direction, although leadership in those groups are better able to make that judgment. In any event, I encourage the NCEES to continue in this vein because I think that only with better coordination of our activities can we have the impact on important registration, liability, and litigation issues that we need to have in our state and federal governments.

The NCEES has had another very good year financially. We started the year projecting an operating margin of about $250,000 and should end the year substantially ahead of that figure, perhaps nearer $400,000. This has been the continuing result of actions taken a couple of years ago to better contain costs and better promote the examinations, publications, and records program. I want to sound one note of caution, however, engineering enrollments are much smaller than they were ten years ago and there is no indication of a significant increase in the near future. Engineering employment is also declining. This year there were 3,000 fewer candidates taking the FE examination than a year before, which translates to almost $100,000 in lost revenue. Clearly, this trend bears careful attention in the coming year.

I now want to turn my attention to, what is to me, the most important aspect of this report, which is to thank all of you for your support and assistance throughout the year. All the committees have been phenomenal in their attention to the charges presented, often dealing with them with a vision and clarity far beyond what I had foreseen. It is truly gratifying to see the results of having dedicated and talented people tackle the issues presented and come up with creative solutions for consideration by the Council.

The NCEES is blessed with an extraordinary staff which provides the support for the President and all the other officers. I particularly want to acknowledge the efforts of Roger Stricklin, Earl Herndon, Beth King, Pam Powell, Diane Quarles, and Craig Upshaw. They have responded to every request for information, data, or help in a most professional and supportive manner.

Finally, I want to extend my sincere thanks to the entire Board of Directors. It is truly rewarding to serve with such a distinguished and capable group of engineers and surveyors. They are all outstanding leaders in their own right with independent thoughts and open minds seeking the best course of action for the NCEES on every decision item, no matter how small or large. They have given freely of their time and talent to the NCEES and in support of everything I have attempted to accomplish. My successor, Leon Clary, is a person with vision, energy and dedication to the profession. With Leon and the rest of your Board, the NCEES is in very good hands.

In closing, I want to express my whole-hearted appreciation for the singular opportunity to serve as President of the NCEES. I have said on many occasions that the NCEES is truly a "class act" and to be given the responsibility to be president of the Council is an honor beyond anything I could have imagined. I want to extend special thanks to the members of the Wyoming Board who were crucial in making this happen and are very special people whose friendship I will always treasure. I know that the reason the NCEES is such a "class act" is that all of you who make up the Council are truly class people. It has been a genuine privilege and pleasure to serve you this year and while I don't know how to adequately express my appreciation I will attempt to do so through continuing to give of my time and effort in the coming years. THANKS!

President's Report—1995
Leon H. Clary, P.E., L.S.

This year has been the highlight of my professional career because of my interaction with the *cream of the crop* in the engineering and land surveying professions.

There are many very critical issues that are coming before the Council in Pittsburgh, and it would behoove each of you to carefully read through this entire *Pre-Convention Reports*. In particular, you need to pay close attention to the Committee on Examination Policy and Procedures and the Committee on Examinations for Professional Engineers recommendations for the Principles and Practice (PE) examination. There are significant decisions that need to be made. Also, read Charles Kimberling's report on the United States Council for International Engineering Practice (USCIEP). The proposed Mutual Recognition Document needs to be ratified by this Council, as well as NSPE and ABET, the three organizations that make up USCIEP. This document has been discussed in detail at each zone meeting, but your careful review and discussion at the Annual Meeting are very important.

The last action item that I want to call to your attention is the Strategic Plan. Before I get into that, I want to talk about some of my activities and thoughts that have been generated during the year. I have tried to focus on relationships with other organizations—both within the United States and with other countries. My purpose has been to determine those organizations that have mutual benefit where we should establish and/or maintain a sustained ongoing relationship and also to attempt to minimize our activities where minimal benefits are achieved.

I started this process before I was formally installed as President-Elect, by referring to a memo that Roger Stricklin had written about three years ago, assessing the pros and cons of each organization. Using that as a starting point, I then discussed the interactive benefits with various past presidents and with Walt LeFevre, who has had extensive exposure to many of said organizations. With these items as guides, I embarked on my Presidency with specific goals in mind to firm up sustained relationships where significant information dialogue benefits are received, minimize future meeting attendance where they are not, and seek beneficial relationships to represent the land surveyors. Given that, my thoughts are:

- Accreditation Board for Engineering and Technology (ABET)—We need to maintain a liaison at the leadership level because this organization provides the foundation on which our entire licensure system is based. In addition, ABET is involved with negotiations with other countries in order to determine substantially equivalent foreign education programs. We need to have a clear understanding of these, and what it means to us as regulatory bodies. ABET also needs to clearly understand our needs.
- American Association of Engineering Societies (AAES)—AAES is an umbrella organization of various engineering societies of which most are not licensure focused. Many of their members are engineers that fall in the exempt category (industrial, etc.). Very little of their activities focus on licensing; however, they are involved in the international arena through World Federation of Engineering Organizations (WFEO) and Pan American Union of Engineering Associations (UPADI). We need to monitor these activities to protect our interests.
- Interprofessional Council on Registration (ICOR)—This group currently consists of the NCEES, NCARB, and CLARB. We meet once a year and rotate the chairmanship. The meeting is usually only four or five hours long. The participants discuss activities going on within the three organizations. This past year, NCARB brought the Interior Design Group before us for membership, and we discussed the Geology Boards (ASBOG), even though they had not asked for membership status. The Interior Design Boards were turned down, because it was felt that there is still too much influence from the professional societies, as

opposed to it being just regulatory oriented. I also have to say that I think the value received from ICOR is minimal, and has accomplished little over the past several years toward interprofessional relationships, especially with the architects. I would hope that the meetings could get back on track and continue, even though the value has been questionable, because the relationships could be worse otherwise.

- Participating Organizations Liaison Council (POLC)—The meetings are less than one day in length with all of the organizations generally stating what is going on within their groups. Not all representatives are presidents or presidents-elect of their organization, and as a result, the emphasis for the liaison activities is not as effective as it might be otherwise. Many of the organizations represented have much closer liaison activities at the leadership level through participation in each other's annual meetings. The effectiveness could be improved by requiring written reports distributed ahead of time and better planned presentations made at the meeting. Usually, only the NCEES has formal presentations.

At this point, I would like to talk about some activities that I think are *very important* and must continue on a sustained basis because the mutual benefit received is very high:

- National Society of Professional Surveyors (NSPS)—Up until this year, the relationship with this organization has only occurred if the President or President-Elect of the NCEES was a member of NSPS. We had not received formal invitations, but through my activities this year, I think we will in the future. I made a point to them that they must have more direct involvement at the leadership level with the NCEES, they must give input to those issues that affect surveyors, and they must do it in a direct fashion from the top. The comments were well received, and we will have a much better, active relationship in the future. I think this will be the beginning of some very good dialogue between the two organizations.

  NSPS and CCLS have begun discussions regarding NAFTA. As stakeholders in that process, I have made it known that we must be a part of that dialogue, and can positively contribute based upon our experience in engineering. We are working toward a joint relationship with NSPS to address NAFTA trade issues.
- Canadian Council of Land Surveyors (CCLS)—For several years, we have been trying to establish a relationship with this organization, and this year, I think we finally achieved that and further established a direct sustained liaison between the leadership of the two organizations. The value received from this liaison is more than just a better understanding of how we practice across the border, it also provides a mechanism to exchange information regarding liaison activities that are going on worldwide.
- Federation Internationale des Geometres (FIG) (International Federation of Surveyors)—This worldwide organization for surveyors needs to be evaluated and assessed over the next two or three years. FIG meets only once every four years, and its next meeting will be in 1998. Serious consideration should be given to attending that meeting and making a final determination as to the value of its liaison activities from an international standpoint. Warren Fisk has information on FIG and will be following up through the various commissions within the Federation.
- National Society of Professional Engineers (NSPE)—This relationship has been sustained and ongoing for some time and continues to prove to be of significant benefit. The input received and the dialogue that is ongoing is of significant value in decisions that are made by the Council regarding licensure.

• Canadian Council of Professional Engineers (CCPE)—I have been directly involved with CCPE for about three years now, and I have found this organization to be most beneficial. CCPE is very involved in the international arena, and the reception by the membership, the liaison value received, and the information sharing is of utmost importance. There are some significant philosophical differences between our licensure processes. I do not think that either Canada or the United States is going to revise its requirements to directly allow reciprocity. However, I feel strongly that the more we talk and discuss our differences, that over time, those differences will diminish.

We all realize that the primary difference currently is the issue of whether a fundamentals examination should be required for an individual who graduates from an accredited program. I should point out, however, that three years ago the experience requirements in Canada generally was two years. In that succeeding period of time to the present day, just about all of the provinces have now changed to a four-year level of experience which is more consistent with what we require.

Within the past year, I have also attended the Canadian Engineering Qualification Board's (CEQB) meetings, where we have had very beneficial dialogue regarding criteria to be eligible for licensing in the two countries. I think this has helped significantly in the understanding of our thought processes, and this relates directly to CCPE.

One of the things that has become very obvious to me this year has been the fact that many other countries include education, experience, and licensure under one organization. In the United States, however, we are three organizations (NCEES, NSPE, and ABET). This has created a perception problem. The Washington Accord was signed in 1989, and even though it only addressed education, Ireland, for example, perceives this as relating to the licensure process. Comments were made to me at a meeting in Atlanta that drove this home. Even though a document such as the Washington Accord is executed relating only to education, it is important that the presence of the NCEES be felt because we are customers of that education process. We need to be a part of it so that we can present ourselves as an integrated process. I will be an observer of the renewal process for the Washington Accord, and I will be able to report on that in more detail in August.

When the free trade agreement in Canada was originally implemented, we formed the United States Council for International Engineering Practice (USCIEP), which is made up of the three organizations. This was done in order to provide an umbrella entity for international negotiations. This same entity was then used to carry forward with the NAFTA negotiations, and it has been formally recognized by the United States Trade Office for that purpose. I have attended all USCIEP meetings for the last two and one-half years, and it has become very obvious to me that to be most effective, the leadership of the three representative organizations should be in attendance in order to exert the proper influence on USCIEP. The membership in USCIEP is for three-year terms with two members elected from each organization. In an attempt to make USCIEP more effective, I called for a summit conference of the three organizations which was held in Baltimore at the ABET headquarters on April 19, 1995. The discussions focused on a unified front when dealing with other countries. This is difficult when philosophical differences exist (especially over FE examination requirements for EAC/ABET graduates), but a clear consensus was reached that the front on any specific issue should be unified. In order to strengthen USCIEP (i.e., get more attention from the parent organizations' leadership), we decided to propose a bylaws change that would have the Board of Directors of USCIEP consist of the Presidents and Executive Directors of each of the three

organizations. This would force the leadership to get together annually to discuss international direction and to elect the officers of USCIEP.

Having said all of that, let me try to put some of my recommendations down for future consideration:

1. Activities relating to other organizations, and in particular, when those organizations relate to other countries, must have a presence by the leadership of the NCEES.
2. Representation to other countries should represent the whole licensing process in the United States. This should be done through an organization such as USCIEP, and a similar organization should be considered for land surveying.
3. The main organizations within the United States that should have a sustained liaison relationship are NSPS, ABET, and NSPE. Liaison should continue through ICOR and POLC, and activities of AAES need to be closely monitored.
4. Sustained relationships must continue with CCLS and CCPE. Activities of FIG and WFEO should be explored and evaluated for similar purposes.
5. Attendance at other technical societies within the United States should be minimized, if not eliminated, due to the minimal value and overlapping nature of POLC. Requests to speak at said organizations should be weighed very carefully, and only accepted if there is significant benefit to the NCEES.
6. The Executive Director exerts much influence with organizations due to the continuity that he/she provides. The Executive Director should be in attendance at meetings where the leadership is in attendance in order to provide that long-term continuity.
7. Liaison to committees should be focused on members of the staff other than the Executive Director in order to cut down on those travel requirements. I have consciously tried to focus committee liaison efforts with other members of the Board, and I feel that this is a very viable and workable way to allow the President and Executive Director to focus on "the general public."
8. Probably the single most important philosophy that I have learned over the past two years is that the relationships with other organizations, and in particular other countries, must reside with the President of the NCEES. This has caused me to look at how we can better utilize the Committee on International Relations. I have looked through the past three or four years of *Proceedings*, and I find that the activities of the committee have not been hands-on in the international arena, undoubtedly due to various charges, budget constraints, etc. I recommend that the Board of Directors, the Advisory Committee on Council Activities, and the Committee on International Relations jointly discuss the committee's activities and how it can be more effective in relation to the need to have the Council leadership directly involved in the international arena.

At this point, let me come back to the Strategic Plan. This plan was developed by the Board of Directors at meetings in June and November 1994 and February 1995. The Mission and Vision were presented for initial input from the Council at our meeting last August in Rapid City, and were further addressed at the referenced Board meetings. The strategies were broken down between domestic and global. The entire document was presented at the Presidents Assembly in March for input. In addition, there was discussion at most of the zone meetings and at the POLC meeting. The purpose of the Strategic Plan is to be used as a guiding light and thought process by all of the committees of the Council. Granted, not all strategies relate to all committees, nor should each

committee attempt to do something that relates to each strategy. I recommend that the Council approve this document so that it may be referred to each committee in order for them to do a self-assessment of their activities, prepare a sub-strategic plan of their own, and refine their charges to meet these guiding principles. The individual committee plans should be submitted to the Board of Directors for approval. The Strategic Plan should be reviewed by the Board of Directors at least every two years for refinement in order to keep up with our changing society.

Unless there are objections, this report is approved for printing.

Motions:

1. I move that my recommendations herein be considered by the Board of Directors as guidelines for liaison activities and continue to be evaluated and refined.
2. I move that the Strategic Plan be approved by the Council and that:
   a. it be referred to each committee for self-assessment of their activities, preparation of a sub-plan more directly focused on the committee purpose, submission of said plan to the Board of Directors for approval, and refinement of their committee charges as necessary.
   b. the plan be revisited by the Board of Directors at least every two years.
   c. the Constitution and Bylaws be reviewed and modified as necessary from time to time to keep current with strategic thinking.

[As was the intention, the Strategic Plan is updated every two years. The current Strategic Plan is posted on CouncilNet.—Ed.]

President's Report—1996
Warren L. Fisk, P.E., L.S.

My year as President of the Council is rapidly coming to an end. Even with a strong year of preparation as President-Elect, there have been many times I felt I had "more on my plate than I could pray over." Nevertheless, and in spite of unanticipated issues and events, the Council has moved forward. Much of the progress is not of my effort, but must be credited to our Executive Director, Betsy Browne. Somehow, when not traveling with President-Elect Lewis and me, she has found time to organize or reorganize the Council office and staff to increase the effectiveness of those who already work so hard for us. Further, she has supervised the modernization of our communications by setting up the Council homepage on the Internet and getting the Board of Directors accessible by E-mail. Betsy and staff have done yeoman's work. They deserve recognition for their effort.

For my part, I have chosen to report on three arenas, each beginning with the letter "I" that have kept my days (and nights) full.

First and foremost is the internal mechanism of the Council. The work of the Council is done through committees, and this year has been no exception. In addition to the routine efforts, each committee was charged to self-assess their activity in view of the Mission and Vision of the Council and to plan recommendations to bring their efforts in line with future goals. President-Elect Lewis will be spearheading the effort to coordinate those plans for a unified effort to serve the public and Member Boards as effectively as possible. Regarding this year's charges, the reports are contained herein, and I hope you have the time to evaluate them and consider the various implementing motions. My thanks go to all committee chairs and members for their efforts on behalf of the Council.

One area of internal concern is worth a mention here. Examinations for engineers, both Fundamentals and Principles and Practice, have been progressing toward new formats in accordance with previously established guidelines. There are some within the Council, and others from outside, who question the direction of the new PE format (breadth & depth). A zone resolution requesting reconsideration of the change will be discussed. I wish to go on record favoring the direction we have already taken. We have invested a large amount of time and money in developing this format. I assume that a majority of the 130 members and consultants who serve on the Committee on Examinations for Professional Engineers (EPE) already favor this change. Further, this concept was discussed thoroughly at the Presidents' Assembly and each of the zone meetings last year. Finally, that issue was debated at length in Pittsburgh, and the vote was to proceed. True, the present system has served us fairly well in the past, but until we grasp the means to measure candidates on the same individually focused range of items we will never be able to say we have done our best. Some may discount the risk that our current system might be challenged. I believe that the integrity of our process should be such that, knowing that there is probably or even possibly a better and more reliable examination method, we should not hesitate to implement that process. We chose to do this a year ago, and we should continue with that effort.

Another implementing motion this year will recommend changing to 100 percent objectively scored PE examinations. We have already proven to ourselves that objectively scored (multiple-choice) items discriminate as well as subjectively (essay) scored. We have also proven that the scoring of subjective items is not as reliable as we would like. Essay questions produce essay answers and essay grades. When any amount of unreliability exists with scores near the pass point, there is danger that candidates in that group may be in the wrong category of pass/fail. Finally, by changing to all multiple choice, we will be able to consider the variations in difficulty between examination items. This should better assure us that the pass rates are at entry-level competency. In my opinion, continuation into breadth & depth and full objective scoring will be a giant step forward for the Council.

The second "I" arena is interaction between the Council and the professional societies or related groups. Recognition and understanding of each other's goals and objectives is critical to our well-being. We were fortunate that Betsy, Skip, and I were able to attend 12 of 15 such meetings and thankful that Betsy, along with Skip and Leon, attended the remainder. There were a few other meetings we were unable to attend due to schedule conflicts. With increasing numbers of future meetings, both in-country and around the world, it will soon become impossible for the leadership to attend all. The Council may need to develop other means of maintaining contact, such as increasing the Board of Directors' liaison duties to include select societies or by longer term appointments of special ambassadors.

Two special groups that the Council participated in were the Task Force on Licensure Models and Task Force on Engineering Education Assessment. Although neither report is final, each, and particularly the Licensure Model, have been evaluated by the member groups and are in these proceedings for your consideration. President-Elect Lewis' comments on the Licensure Model in the *Licensure Bulletin* of July 1996 are on target.

The final "I" is for international. Beginning with the reorganization of USCIEP into what is hoped to be a more effective group representing the education, licensure, and practice of U.S. engineers, the Council has invested considerable time and money to firm up and present our position at the NAFTA meeting in February. Meanwhile, the USCIEP Board of Directors and Operations Board are working to achieve better internal recognition of the stakeholders' interests. The work with NAFTA is merely a prelude to similar future agreements between continents.

With the extension of the Washington Accord interests from educational recognition toward full professional licensure, USCIEP will be more active than ever before. On the one hand, the United States should promote our assessment methods as being among the best in the world. On the other hand, we must prepare to recognize equalities in other countries' methods. We must realize that identical processes are not practical on an international level. Equal processes are. I am very excited about the interest China has shown in our examinations. Their effort to prepare their own examinations, patterned after our specifications, indicates they may be among the first, beyond NAFTA, to compare equal qualifications for licensure as a basis for mutual recognition.

Finally, I must thank the members of the Council for the wisdom and guidance provided. I attempted to utilize the talent pool of our membership to its best advantage. And now I must echo the sentiments expressed by all Council Presidents: The honor of leading this wonderful group is the highlight of my life. To have taken a part, however small, in the progress of the Council has given me much joy and comfort. I thank you, the members, for this opportunity.

FINAL DRAFT II June 6, 1996

PROPOSED NATIONAL MODEL FOR ENGINEERING LICENSING AND REGISTRATION

D. E. Rathbone, P.E.
Kansas State University
National Society of Professional Engineers
J. D. Hinton, P.E.
National Society of Professional Engineers
P. G. Hoadley, P.E.
Vanderbilt University
Accreditation Board of Engineering and Technology
A. T. Kersich, P.E.
Accreditation Board of Engineering and Technology
F. A. Kulacki
University of Minnesota
American Society of Engineering Education
E. W. LeFevre, P.E.
University of Arkansas
National Council of Examiners for Engineering and Surveying
C. E. Locke, Jr., P.E.
University of Kansas
Engineering Deans Council
R. W. McClure, P.E.
National Council of Examiners for Engineering and Surveying
A. Schwartz
National Society of Professional Engineers
E. T. Smerdon, P.E.
University of Arizona
Engineering Deans Council

J. W. Steadman, P.E.
University of Wyoming
American Society of Engineering Education

ABSTRACT

The basic model that is proposed is for the BS graduate from an ABET/EAC accredited program. Its salient features include the requirement of an engineering registration examination (the new Fundamentals Examination [FE]) for the BS graduate, the designation as a Registered Engineer (RE) for those BS graduates who pass the FE, and the designation of a new classification, the Licensed Professional Engineer (LPE), for those who successfully pass a professional licensing exam on codes and ethics after four years of appropriate practical experience. Continuing professional competency is also recommended as a requirement for continuing active status as an LPE. The paper also discusses possible variations to the licensure requirements for those individuals with a masters and/or a Ph.D. in engineering.

I. Introduction

The National Society of Professional Engineers (NSPE) initiated a task force in 1994 to study the licensure process and related model(s) for an engineering graduate in the United States to become a [licensed] professional engineer. The task force had representation from the American Society of Engineering Education (ASEE), the National Council of Examiners for Engineering and Surveying (NCEES), the Engineering Deans Council (EDC), the Accreditation Board for Engineering and Technology (ABET), and the National Society of Professional Engineers (NSPE), with two representatives from each group. This paper presents the results of the task force.

The general charge to the task force was to search for ways to increase the number of engineers who become licensed professional engineers while ensuring that the protection of the public is properly maintained. An overriding priority was the goal to provide professionally competent engineers with high ethical standards and commitment to service and protection of the public.

The task force members were deeply concerned that only about one in five graduate engineers chooses to become a licensed professional engineer. The reasons for this are many, including the exemption of many engineers in industry and government service from the need to be licensed in order to practice engineering. The task force believes that there is need to facilitate the entry into the process of becoming licensed by providing greater encouragement of all engineers to embark on that process immediately upon graduation with the bachelor of science in engineering.

II. Present Model(s)

The task force first reviewed the NSPE documents PP No. 152, the Registration and Qualifications for Practice document for engineering, and PP No. 128-A, which relates to engineering technology degrees. These documents present the present guidelines for licensing that are used by the states. The key sections of PP No. 152 and PP No. 128-A are listed below.

1. Engineering Licensure

> "Licensure as a professional engineer" is the statutory process through which a person meets the legal requirements sufficient to be permitted by law to practice engineering in that jurisdiction. Licensing and registration are the terms used, often interchangeably, in the state statutes to establish these requirements.

State licensure laws for design professionals are predicated upon and justified only as a means to protect the public health, safety, and welfare. The public interest is best served by the licensure of all qualified individuals within the engineering profession.

2. Licensure Law

NSPE endorses enactment of uniform licensure laws in all jurisdictions. NCEES has developed model laws as guides for use by engineering licensure boards and legislatures in the interest of achieving uniform laws for the licensure of engineers in all jurisdictions.

NSPE endorses the NCEES *Model Law* definitions of the "practice of engineering" and the "practice of land surveying" and encourages enactment of *Model Law* provisions.

NSPE endorses and supports the concept of licensure of engineers only as "Professional Engineer" and opposes licensure status by designated branches or specialties.

3. Qualifications

It is the policy of NSPE to encourage the adoption of the following provisions in all jurisdictions:

a. Establish the bachelor's degree in engineering from a program accredited by the Accreditation Board of Engineering and Technology/Engineering Accreditation Commission (ABET/EAC), or one assessed by ABET/EAC as substantially comparable, as the minimum educational requirement for registration.

b. Pass the Fundamentals and Principles of Practice examinations as prepared and administered by NCEES. NSPE encourages all eligible students to take and pass the NCEES Fundamentals of Engineering (FE) examination prior to graduation.

c. Obtain at least four years of professional experience after the degree described above, with experience credit allowed for graduate study of engineering or teaching of advanced engineering subjects in an ABET/EAC-accredited engineering curriculum.

d. Permit a nonregistered individual who holds both an ABET/EAC-accredited undergraduate degree or its equivalent and a Ph.D. from an engineering program that is ABET/EAC accredited at the undergraduate level to be excused from taking the FE examination.

e. Engineering faculty who hold an ABET/EAC-accredited undergraduate degree or hold a Ph.D. in engineering from an institution that offers an ABET/EAC-accredited undergraduate degree should be excused from taking the FE exam.

12. Professional Engineer Intern

To more adequately reflect the educational achievement of candidates for licensure and their progression toward professional engineer status, NSPE supports the use of the title Professional Engineer Intern (PEI), formerly Engineer in Training (EIT), and will exercise its influence to secure appropriate changes in the statutes and literature of the profession to include the new title.

128-A Technology/Engineering

The National Society of Professional Engineers believes that a bachelor's degree from an ABET/EAC-accredited engineering program is the minimum education requirement for those seeking to become registered professional engineers.

An ABET/EAC-accredited four-year program in engineering technology leading to a bachelor's degree is recommended as the minimum education requirement for those

seeking to become engineering technologists. Graduates from these programs who wish to be recognized as engineers should be encouraged to earn the bachelor's degree in engineering and seek to become registered professional engineers.

An ABET/EAC-accredited two-year program in engineering technology leading to an associate degree is recommended as the minimum education requirement for those seeking to become engineering technicians.

Both engineering technology bachelor's degree programs and associate degree programs should be recognized as preparing persons to work "in support of engineering activities" (as stated by ABET) and not as substitute programs for the bachelor's degree in engineering. Technologists and technicians should be encouraged to seek professional recognition by obtaining NICET certification.

III. Models Considered

The task force studied four models in detail that were proposed by various organizations and individuals and also discussed briefly the global aspects of licensing. The Engineering Deans Institute in Tucson, sponsored by the Engineering Deans Council, supported and forwarded to the task force a proposal by James Eifert, Dean of Engineering at Rose-Hulman. The salient features of the Eifert proposal included: (1) the waiving of the FE exam by BS engineering graduates from ABET/EAC programs, (2) the licensing without examinations of those with earned doctorates in engineering from institutions with ABET/EAC programs, and (3) the eventual requirements of recertification and continuing professional education. This proposal also suggested that, beginning in the year 2000, 75 percent of the engineering graduates from a university must be Engineering Interns in order for the program to be accredited by ABET.

A model was proposed by Dr. Frank Kulacki, University of Minnesota, that required an individual to obtain a professional degree at the master's level in order to obtain a license to practice as a professional engineer. This model would require a BS degree in engineering from an ABET/EAC-accredited institution and would also include the Engineering Intern category. The professional degree would include design projects, project management, ethics, codes and standards, laws and regulation, etc.

A third model that was discussed was the Robert Gibson Model, proposed by Gibson at the Southern Zone Meeting of NCEES in Augusta, Georgia. The model includes altering the FE examination and replacing two examinations with one examination (elimination of the PE examination), using the examination as an educational assessment tool for all ABET graduates, changing the permissible use of the title Professional Engineer, development of a grandfathering process, elimination of all exemptions, and a continuing professional educational requirement.

The final model that was evaluated was the NSPE Registration and Qualifications for Practice Committee Model. Its basic features are that there is only one technical test, the Fundamentals exam, which would be required of all ABET/EAC programs. It included education, experience, and an examination. The model had no special method for getting faculty licensed.

IV. International Engineering Practice

The task force did not consider the issue of international practice directly. The members were well aware of the concept of international "licensure or certification" and undoubtedly the future need for same but made the decision to concentrate first on a national model for engineering

licensure and registration. The task force was particularly cognizant of the Mutual Recognition Document (MRD) and recommendations to the NAFTA Commission since two of its members, E. W. LeFevre and A. T. Kersich, were signees of the document for the United States. The MRD is recommended as a valuable reference for study of the internationalization of engineering practice.

The Canadian Professional Practice Examination appears to have many of the features that are proposed for the professional licensing examination of the proposed model and will be discussed relative to that examination later.

V. Proposed Basic Model for Engineering Licensing and Registration

The task force arrived at a consensus of a basic model that is depicted by the flow chart of Figure 1. Summarized below are the various definitions and designations that define the flow chart.

1. The model assumes the candidate has an EAC/ABET-accredited baccalaureate degree in engineering or a substantially equivalent engineering degree. In ABET terms, "substantially equivalent" applies to engineering programs at international institutions, i.e., those that are signatory nations to the Washington Accord or those that have been visited by an ABET team at the request of the institution. For the purposes of this proposed engineering licensure model, the ABET definition for a "substantially equivalent engineering degree" is intended.

2. To start the licensure process, the BS graduate is required to take and pass the *new* Fundamentals exam (a half day on engineering fundamentals and a half day on subjects that are discipline specific), effective October, 1996. The new FE examination will be composed of a morning session on fundamental knowledges for all disciplines, followed by an afternoon session in one of the following: chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, or general. The morning portion will have two new subject areas in addition to the current FE topic areas—computers and ethics. There will be 120 two-minute questions rather than the current 140 questions. The afternoon portions will be 60 four-minute questions.*

3. The engineering graduate that fulfills steps 1 and 2 above would be designated a Registered Engineer (RE). In the originally proposed model, it was recommended that this individual be designated a Professional Engineer (PE). This proposed title was apparently considered too drastic by many in the profession, and possibly confusing to the public, and thus has been dropped, at least for the near future. Some members of the task force still consider it as an excellent choice for this step in the licensure process.

4. The model requires four years of appropriate and acceptable experience before the RE can take the Professional Licensing examination (PLE). Acceptable experience is defined as that which is appropriate today in the licensing process for becoming a PE and includes university-level teaching, professional practice, etc. with appropriate professional mentoring.

5. The PLE would include ethics and ethical practice, codes and standards, and related governmental, legal, and public policy issues. The professional practice examination required in Canada (their only exam) is a three-hour, closed-book examination on the ethical considerations and obligations that accompany the privileges of professional status and the legal concepts relevant to professional engineers.** It is envisioned that the basic model's PLE would have many areas of

*"*The New Discipline-Specific FE Examination," E. Walter LeFevre, ASEE Midwest Section Conference, April, 1996.*

***1994 Canadian Council of Professional Engineers Annual Report.*

emphasis similar to that of the Canadian examination but with considerable differences in the areas of codes, standards, and legal requirements. The PLE is also proposed as a four-hour examination.

6. After an individual passes the PLE, he or she would be designated a Licensed Professional Engineer (LPE). The LPE designation would be required for individuals who work in private practice or forensic engineering and who offer engineering services directly to the public. They would be in charge of engineering projects and would sign and seal engineering drawings for submission to a public authorities, building departments, or other public officials for approval.

7. Continuing Professional Competency (CPC) requirements are proposed as mandatory for an individual to keep an active LPE license.

At no time in the history of the engineering profession have the technologies associated with engineering changed more rapidly. Just as in the profession of medicine, the professional engineer must commit to a lifetime of learning if he or she is to be at the cutting edge of the profession. Therefore, the task force believes that one of the most important factors related to excellence in engineering service and the protection of the public is to provide a means of ensuring that all licensed professional engineers continue to update their credentials throughout their professional lives.

The task force recommends that all states require that licensed professional engineers be required to periodically show evidence that they are maintaining technical competence in their field of practice. There are numerous ways in which such competence can be maintained. The programs to ensure technical competence should be developed within each state and may include programs provided by technical societies, local universities, and through telecommunications media—such as the Internet, National Technological University, and other such advanced instructional delivery systems.

It should be noted that NCEES adopted a CPC model with guidelines last year. This model is recommended by the task force as an excellent source for defining the CPC portion of the flow chart in Figure 1.

The basic model described above has the potential, perhaps for the first time in the history of the engineering profession, of bringing the engineering profession together as a cohesive group of professionals while still ensuring the safety of the public.

VI. Other Paths for Professional Engineering Licensure

There are many other possible paths to professional engineering licensure in addition to the proposed basic model described in Section V. Only two will be discussed in this section. Grandfathering of university faculty members who have an engineering degree from an ABET/EAC-accredited engineering program (or one that is substantially equivalent as previously defined in Section V.1) will be discussed in a separate section. The first proposed alternative path to licensure is for the individual who has both a BS and an MS degree in engineering, one of which must be from an ABET/EAC-accredited engineering program. As a minimum, the task force agreed that the individual should be given the equivalent of one year of experience for the second degree. Some of the task force also support the waiving of the FE examination for this individual. In this case, the BS/MS graduate could apply directly for Registered Engineer (RE) status and enter the flow chart of Figure 1 at that point, but with only three years of experience required to take the PLE. The task force did not finalize on this issue but decided to simply present some of the options for future consideration once the basic model was established.

The second proposed alternative path to licensure is for the individual who has a Ph.D. in engineering from an engineering program that has ABET/EAC accreditation at the BS degree level (or, again, one that is substantially equivalent). The task force recommends (a) waiving of the FE examination and (b) credit for two years of experience toward the four-year requirement shown in the flow chart of Figure 1. These recommendations are very similar to the present guidelines proposed by NSPE (see Section II). The current NCEES *Model Rules* also recommend one year credit for the MS and another year for the Ph.D., plus waiving the FE exam in the present models for professional licensure.

There are many other possible paths to licensure. Many were discussed by the task force, but only the two above and the grandfathering of university faculty are presented here. It should be noted that in previous draft reports of the task force that flow diagrams were included for the MS and Ph.D. graduate. Since consensus of the task force was not reached on these flow diagrams, they should no longer be considered as final recommendations by the task force for paths to licensure.

The above discussion represents the task force's latest recommendation on the other paths for professional engineering licensure.

VII. Grandfathering

The engineering profession has always had a relatively small percentage of engineering graduates from ABET/EAC-accredited programs who opt to pursue the path of becoming licensed professional engineers. This is no doubt due to many reasons, including the historic industrial exemption, which is well embedded in the practice of professional engineering in this country, that are unlikely to be changed. Possibly another reason is the fact that many well-qualified engineering faculty at engineering colleges throughout the nation are also not licensed professional engineers.

The task force believes that the best interests of the engineering profession would be served if graduates from ABET/EAC-accredited programs were actively encouraged by their professors to become licensed professional engineers. One first step in accomplishing this would be to find a mechanism whereby a much larger percentage of the engineering faculty were licensed. It is acknowledged that the reward system for faculty has not made it essential, or even desirable, that many engineering faculty be licensed. Many of these faculty work directly with industry engineers who have industrial exemptions—a fact that does not provide an environment in which faculty see the value of engineering registration and, thus, encourage their students to immediately pursue a path toward licensure.

Faculty members who have graduated from an ABET/EAC-accredited engineering program, or one that is substantially equivalent according to ABET criteria, and have subsequently been awarded a doctoral degree in engineering are by any reasonable measure professionally competent. Moreover, when these individuals have obtained sufficient experience in engineering work, either prior to receiving the doctoral degree or in the teaching of advanced engineering courses, they no doubt have exceeded the minimum technical qualifications to become a licensed professional engineer. Since the current reward structure does not provide an incentive for these faculty members to become registered, the task force believes that efforts to establish an incentive to do so should be implemented. Therefore, after careful evaluation of all of the issues, the task force recommends that faculty with an ABET/EAC-accredited degree and a doctoral degree be grandfathered and offered a one-time opportunity to be licensed. The task force does not believe that doing so would compromise our primary tenet of ensuring that the public is protected. We believe that having a

larger percentage of the engineering faculty as licensed professional engineers would provide an incentive for them to encourage the new engineering graduates to enter the pipeline toward licensure by taking the new engineering registration examination near the time of completion of the baccalaureate degree.

We urge state boards to provide a short time period in which faculty with a Ph.D. would be grandfathered as licensed professional engineers. This time period might be for a period of five to ten years, perhaps until the year 2005. Moreover, when that is done, we encourage each dean of engineering in the nation to use the power of his or her office to persuade faculty to take advantage of this one-time grandfathering opportunity. Such action would help the engineering profession achieve the goal of having more graduate engineers enter the licensed professional engineer pipeline and achieve greater professionalism in engineering.

VIII. Summary and Conclusions

While the task force's proposed basic model for licensure and professional registration represents a consensus of the members of the task force, the members are also soliciting input on the proposed model from the member organizations of the task force, plus input from the engineering community at large. There may well be some "fine tuning" with the model before the final report of the task force is completed.

The basic model could be a help in providing "a common ground" for the engineering profession with the Registered Engineer (RE) designation for all of the BS engineering graduates who pass the FE. The model would hopefully also make it easier to achieve international agreements. The Licensed Professional Engineer (LPE) will provide the necessary background and certification for the safety and welfare of the public.

The use of the titles Registered Engineer and Licensed Professional Engineer will undoubtedly be a major topic of discussion among all groups. In the initial proposals from the task force, the title Professional Engineer (PE) was used instead of Registered Engineer (RE). While the PE designation was accepted by many, it appears that the RE designation is more acceptable at this time.

The mandatory Continuing Professional Competency requirement was strongly supported by the task force. As noted in the body of the report, the engineering profession is experiencing greater changes in its technical fields than anytime in its history. The professional engineer must be committed to a lifetime of learning. Finally, grandfathering of university faculty was considered an important consideration by the task force and was viewed as a very positive step for the engineering profession. It was a concept that was used decades ago for the practicing engineer, and it helped the profession get a "jump start" on the licensing process. Grandfathering of faculty could be equally effective.

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ENGINEERING LICENSURE June 6, 1996

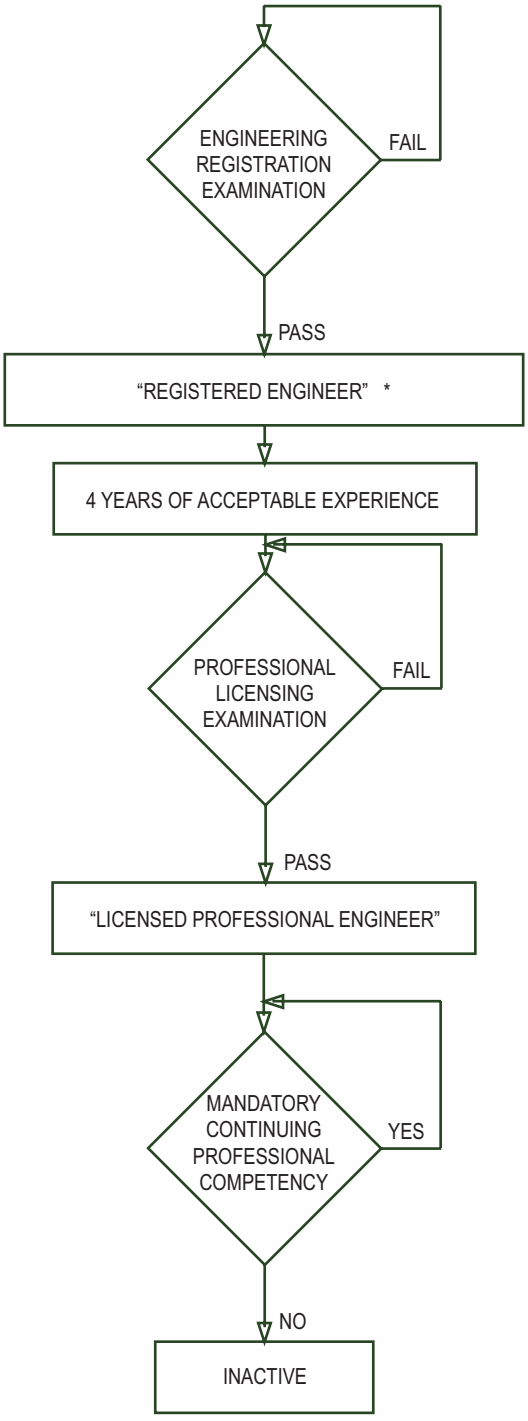


Figure 1

** Possible option would be to designate the discipline of the Registered Engineer. Also, the State Boards may wish to charge a small yearly fee for maintaining the RE status and to maintain a yearly directory.*

President's Report—1997
L. Glasgow "Skip" Lewis, Jr., P.E.

It is now late May. Most committees have completed their charges for this year, zone meetings have concluded, visits to the annual meetings of NCARB and NSPE are on the horizon, and it's time to tender statements for the *Convention Reports*. The months since last August have literally flown by.

Nine months ago when I came to the helm of your ship, we spoke of the NCEES vision and the effort it takes to achieve that vision. I shared with you then (and in last year's *Convention Reports*) those principles which have guided me through the chairs of this great Council. Those principles have served me well in years past. I have held firm to them in this, my year as President of the NCEES.

As we put out from harbor last August, my thoughts were of balmy weather and smooth seas. For most of the journey, that is what we found. But there were periods of gale winds and high seas. My captain's log is nearly filled—much of which describes success in our endeavors, but also spots of disappointment.

During this past year, our Council office has experienced organized change. Contrary to the thoughts of some, the internal changes within the NCEES have been nothing short of spectacular. Departmental reorganization has focused greater attention on constituent communications at all levels and through both long-standing and emerging systems of communications technology. This reorganization has flattened the management structure, broadened decision-making authority, and delivered staff training programs at a level not previously provided at the NCEES. One well-intended benefit of these changes was the transfer of many nontechnical tasks from the Examination Department to other well-qualified areas of the office. This has enabled a smaller, more focused examination staff to concentrate more aggressively on the challenges that confront our vision of excellence in examination development, delivery, and scoring.

As your elected directors and I have steered the ship this year, there were periods of strong undercurrents and underwater hazards—events that slowed our forward progress. Be assured, though, that the course for the NCEES is well charted, and our collective efforts have not lost sight of the goal. Through the fine work of our many excellent committees and a strong core of dedicated staff, much progress has been realized. As we approach New Orleans and our Annual Meeting, decision time is nearing. You will be asked to vote on a number of important issues—some of which will significantly impact the future directions of Council. Without detracting from the very important work of all our committees and the reports they bring for your review, there are several real front-burner issues that, based upon your actions this August, will significantly affect us all. Without any sense of priority, a few words about each are worthy of comment.

Examinations Program

The land surveying PAKS activities are proceeding smoothly and ahead of schedule. The Land Surveying Examination Committee seems to be well in control of a process that is working well.

For the engineering examinations, this has been a year of implementing change and examining the health of that program. The new discipline-specific FE examinations were given for the first time last October. We now have a history of two such administrations. Development of breadth and depth modules for the various PE examinations continues to move forward, but at a slower-than-expected pace. Examination staff and your incoming EPE Committee Chair have attended (and gained knowledge from) an intense tutorial session at the Chauncey offices in Princeton, New Jersey. Your Examination Audit Committee has carefully reviewed those examinations scheduled for audit this year. And finally, the Blue Ribbon Panel on Engineering Examinations, the panel created last year

out of your desire to more thoroughly review the examination program philosophy and performance, has undertaken an in-depth evaluation of our engineering examination program.

From my study of the Audit Committee findings, my review of the Blue Ribbon Panel report, and from discussions with informed volunteers and staff, one message is consistent. Our examination process needs to be, and can be, improved. Evidence is growing that serious attention must soon be directed to midcourse corrections. Some process improvement plans have already reached the formation stage and are ready for implementation. Much more needs to be done.

In several examination disciplines, pass rates are discouragingly low. Our Audit Committee has made a strong case that item-writing specifications are often ignored or left uncompleted and that many problems are too difficult for the time allotted candidates to demonstrate competency. For the past two years, there have been workshop scoring sessions that tell us cut scores recommended by examination policy statements are inconsistent with sound psychometric principles.

With two administrations of the new discipline-specific FE examinations behind us, the results are, in my mind, disappointing. Based upon reports of engineering school enrollments, approximately 80 to 90 percent of the EAC/ABET program graduates are from engineering disciplines encompassed by the five discipline-specific FE modules developed by the NCEES. Thus, isn't it reasonable for us to expect that a large majority of these EAC/ABET program graduates would take one of these five discipline-specific modules? Surprisingly, that has not been the case.

Results of the first two administrations of our discipline-specific FE examinations show that more than 50 percent of the EAC/ABET "first-time takers" are electing to take the sixth module, "General," which measures only the lower-division knowledges (while the five discipline-specific modules measure both upper- and lower-division knowledges). Recognizing this, we have a situation in which more than one-half of the FE candidates are being examined for one set of knowledges (those gained for the most part during the freshman and sophomore years), with the remaining candidates demonstrating knowledges taught in the full undergraduate curriculum. This is clearly a condition of great concern—and one that we must address if this initial trend continues.

With recognition that refinement of the process must occur, some changes are now in the final planning stage by your current President-Elect (Steve Schenk) and your incoming EPE Committee Chair (Frank Loudon). Both have done a yeoman's job in outlining new concepts for the committee structure. Much more needs to be done, but the beginnings are in place. If the substance of recommendations from the Blue Ribbon Panel is embraced by the Council, and if corrective actions put forth by the Audit Committee are implemented, the "best there is" examination program will get progressively better. Please commend Steve and Frank for the start they have given us, and provide support and encouragement to stay the course. Please also carefully study the report of your Blue Ribbon Panel. Get prepared to weigh the facts and recommendations with a knowledge of the issues. Several of their recommendations will undoubtedly be controversial.

Computer-Based Examinations

Council made a decision last year to move toward implementation of computer-based examinations. The Committee on Examination Policy and Procedures (EPP) has developed for your consideration a game plan for implementation. You should study the plan carefully. Logistics, examination fees, and local board constraints may be concerns which are much more complex than the technical side of item development, security, and electronic conversion.

You will be asked to consider and endorse the recommendations by EPP. A part of the committee's dialogue will address examination fee structures. The implications are significant and

impact current Finance Committee philosophies for both examination funding and revenue strategies. It is an exciting plan—the recommended path to computerization of engineering and land surveying examinations. Come prepared to participate in this important matter.

NAFTA-MRD

As you know, your Council's two-year ratification of this document is set to expire in August. Some believe it should die. That would be a mistake.

When the MRD was ratified for a two-year period, the message was to have the USCIEP negotiate language to clarify a jurisdiction's freedom to require written examinations. The USCIEP was willing. They did negotiate, but not successfully. Our neighbors to the north and the south simply would not agree to such clarifying language. They argued it was a change, not a clarification. We disagree. Opinions by our legal counsel on international matters support the NCEES (and USCIEP) arguments. Your Board of Directors is comfortable with the legal opinion and recommends full ratification of the MRD—coupled with the now-attached *Model Rules and Procedures*. These companion documents have been carefully reviewed by various committees of the NCEES and by legal counsel. Our committee on International Relations and ACCA endorse the MRD and the *Model Rules*. They are on target with their endorsements.

All of the concerns that have been identified by those jurisdictions in disagreement with the MRD have, I believe, been addressed by the *Rules* document.

Whether or not we recognize it, the jurisdictions of the United States are now involved in a global business environment—and that includes the cross-border practice of engineering. It is happening now in manufacturing and process industries. We jurisdictional board members are simply not enforcing (or are not able to enforce) licensure requirements where industrial exemptions do not statutorily exist. Cross-border practice is also occurring in your state, in the private practice arena, largely through corporate accommodations and ventures that work around, and in general harmony with, local licensure laws. The future will be different. We have an opportunity to prepare now for that future.

With NCEES ratification of the MRD and the companion *Rules* document, jurisdictions will still preserve their independent right to sign on. Further, when they do sign on, states will have a model document for development of their own rules. And by use of the *Model Rules*, there is every expectation that some measurable degree of harmonization would develop across states. For these reasons, your Board of Directors believes your support and approval of these documents, by ratification, is warranted.

There are, of course, many other important items of business that will come before you in New Orleans. I am confident you will be prepared to act on the motions and maintain the forward course for the NCEES.

At the beginning of this fiscal year, our forecast (and budget) predicted deficit spending. Thanks in large part to strong control of expenses, it appears that our year will end with a reasonable surplus to transfer to reserves. The treasury of the NCEES is a strength we should hold in great pride and maintain in all earnest. For it is with this depth of resources that we can forcefully move forward with the will of Council. We have enjoyed sound financial planning and management over the past; it is more important than ever that we continue to do so. I have every expectation that we will.

As my thoughts now go back over the past year, there are so many acquaintances and experiences that I wish I could share with each of you. The privilege of working with Member Board volunteers from all across the country, of representing the NCEES at meetings of government

officials, and of working with collateral organizations having close ties to this Council will provide lasting memories—a conference presentation to engineering students and faculty of a large university in El Centro, Mexico; observing the very first administration of engineering competency assessment examinations in mainland China; sharing views on international movement of engineers and individual jurisdictional responsibilities with representatives of Canada, England, Australia, Ireland, Hong Kong, Japan, Taiwan, and other countries. All of these are activities which not only form strong memories, but have also helped to convey the strength of individual competency assessment mechanisms used by the jurisdictions of the United States for the regulation of engineering and land surveying practice.

As my year in office winds down, I must say a word of special appreciation to Betsy Browne and Steve Schenk. They have been not only able travel companions for the many appearances required by all of us, but also important sounding boards and sources for reality checks. I must also recognize and express my sincere appreciation to your NCEES Board of Directors. All members are strong, independent thinkers—with each of us, in our own way, speaking for what we believe to be in the best interest of the entire Council. It has been, and continues to be, a pleasure to work with your other elected representatives on the Board.

I also want to express a special thanks to Warren Fisk. Little did I realize two years ago what the job of NCEES President entailed. Warren was a tremendous mentor in that respect, and he has continued to be a strong resource for me in this, my year as President.

There was also the support of Council staff and the untiring support of my dear wife, Irene. From the assistance and encouragement of these "backstage" helpers came the strength to keep going when the days seemed so long. My thanks go to all of them.

To all of our committee chairs and committee members—those of you who have dedicated untold hours and contributed the wisdom of ten thousand—words seem so inadequate to express my thanks for all you have done. And to all those who have provided counsel and guidance to me over the years—individuals long dedicated to the mission of the NCEES and individuals who have worked so diligently without seeking recognition for their services—I publicly express my deepest and sincerest gratitude for your support.

From all of these experiences, I have grown in knowledge and understanding. My hope is that in the process, there was a contribution to the forward movement of the NCEES. For that, in the final analysis, will be the true measure of our success.

President's Report—1998
Steven T. Schenk, P.E.

The preparation of the President's Report is a bitter-sweet activity. On the positive side is the opportunity to review the significant activities of the year. But it also means that the year is nearing an end and many challenges remain.

In my President-Elect's Report a year ago, I outlined the key focus areas for this year. At the top were Council governance and committee operation. The primary reason for this priority was the potential benefit of separating the two major functions of the Council—providing the opportunity for Member Boards to counsel together and providing services to Member Boards. By separating these functions, policies and procedures can be implemented to more effectively provide the services that will allow Member Boards to focus on the significant challenges related to the regulation of the profession. The Council and committees need to spend less time on the

detailed operation of the Council. Other reasons for this priority were the expansion of staff capabilities over the past three years under the excellent direction of our Executive Director and the need to reduce the time associated with volunteer commitment to the organization.

Since the Special Committee on Governance rolled out its preliminary ideas, the Council's response has been extremely gratifying. The changes under consideration are many, and they are significant. The committee is currently reviewing the feedback obtained from the zone meetings, and the discussions planned at our Annual Meeting will set the direction for further refinement during 1998–l999. I commend Bill Karr and his committee for dedicating the effort necessary to provide the Council with this opportunity for self-analysis. The Council's primary product, examinations, remained a key focus area this year following last year's Blue Ribbon Panel recommendations. Through the able leadership of Frank Loudon, chair of the Committee on Examinations for Professional Engineers (EPE), the restructuring and revised operation of this committee has been implemented. Although it is still early, the changes appear to be very positive. The closer involvement of representatives from the societies supporting our examinations has definitely improved coordination. The major challenge remains to obtain an adequate number of volunteers with the appropriate skills to accommodate the critical workload facing this committee.

The Special Committee on PAKS–Land Surveying, chaired by Pete Jorgensen, completed its activities ahead of schedule, and the committee's report is currently being implemented by the Committee on Examinations for Professional Surveyors (EPS). The Computer-Based Testing Task Force is currently receiving responses to their request for information (RFI) in order to finalize their recommendations for Council consideration. Determining the appropriate schedule for this activity remains a major challenge for the Council.

A third focus area is the issue of enhanced mobility for licensees among our jurisdictions. I am extremely pleased that the Council is serious about this issue. Over the year, the profession has reminded us often of the need for improved mobility, and efforts to enhance the international mobility of licensees continues to be impacted by the differences encountered within the United States. The cornerstone of the current activity is the Council Records designation of Model Law Engineer (MLE). The Advisory Committee on Council Activities (ACCA), the Committee on Uniform Procedures and Legislative Guidelines (UPLG), and the Records Verification Committees will be making recommendations to the Council about the MLE, and they deserve serious consideration by the Member Boards.

Many activities needed to be curtailed early this year with the realization that the anticipated revenue from our examinations was not going to meet budget expectations. This is the biggest challenge facing the Council. The Council exists solely as a service organization to the Member Boards, which exist solely because the public and the profession accept the need for regulation to protect the public. The current decrease in applications for licensure may have many causes, all of which need to be seriously studied. I agree with those that believe an appropriate role of the Council is to educate the public and the profession on the purpose and benefits of licensure. If our system is not relevant, that determination needs to be made by an informed public.

Some of the groundwork in this area is in process, and much is left to be done. The Council is moving forward in the area of intern tracking in an effort to influence the 50 percent of interns who do not elect to sit for the professional examination. An ACCA recommendation is being presented to initiate a graduate tracking system to influence the 50 percent of engineering program graduates

who do not sit for the fundamentals examination to begin the licensure track. Related to this are some proposals for discussion regarding changes to our licensing model. I welcome these discussions because I believe our model must remain fluid in order to best meet the needs of the public and the profession.

We have also recently participated in discussions with the professional and technical societies about the role of licensing in the practice of engineering in the United States. I am pleased that, generally, there remains strong support among the leadership of these societies to expand the role of licensing. Various programs are being considered, and the National Society of Professional Engineers (NSPE) has implemented a Member Board coordination program to strengthen the communication exchange between our organizations. I am confident that Andrew will maintain this focus on intersociety relations since these issues truly appear to have us at a crossroads regarding the future of licensing.

The expense containment plan implemented this year also provided some benefits. CouncilNet became a useful alternative, in lieu of just a supplement, for many meetings; and the use of the Internet between staff and Member Boards has been accelerated. I truly appreciate the outstanding job that Phyllis Fenno and the Information Technology Department did in accelerating our goals in the alternative communications area. Recognition is also appropriate for the many committee volunteers that made the extra effort to produce the recommendations that we will be considering in August. The committee product has not suffered from the budget restrictions.

Another benefit worthy of note is the reaffirmation of the direction initiated three years ago to develop revenue sources for the Council. The Council Records Program, continuing professional competency (CPC) tracking, foreign credential evaluations, and publications are services increasingly in need by the Member Boards, and they need to play a greater role in Council finances.

The international area was not supposed to be a primary focus area this year, but it received considerable attention because of the ongoing commitments and the actions taken by the Council at the last Annual Meeting.

Soon after the Annual Meeting, Canada and Mexico were advised of the status of the North American Free Trade Agreement Mutual Recognition Document (NAFTA-MRD) resulting from that meeting, and they declined to reopen discussion on modifying the MRD provisions for at least two years. We are monitoring the implementation experience between Canada and Mexico and with Texas.

We observed China's first official administration of their fundamentals and structural examinations in December. Their licensing system for structural engineers will become effective in January 1999. Approximately 5,000 candidates sat for the Fundamentals of Engineering (FE) exam and 14,000 for the structural exam. Their exams have been evaluated, and during their visit to California in April we discussed the equivalency of their examinations. These visits concluded the initial three-year agreement. Discussions have been initiated on continuing assistance and evaluation, taking into account the Council's actions in August. I remain supportive of continuing to assist China in the development of their licensing system, which is modeled after the United States system.

In October, the Hong Kong Working Party spun off from the Washington Accord group and became the Engineers Mobility Forum (EMF), consisting of the economies signatory to the Washington Accord agreement. We remain active in the EMF through the United States Council for International Engineering Practice (USCIEP), and the USCIEP concurs with focusing our international activities with EMF since its cornerstone is the equivalency of educational programs.

Through the USCIEP, we also continued to participate through Stage 2 of the Human Resources Development subcommittee of the Asia Pacific Economic Cooperation (APEC). There remain numerous concerns with the equivalency basis and the direction of this group that, coupled with the current financial constraints of the USCIEP, have resulted in a recommendation to only monitor their Stage 3 activity.

The Council will be addressing two international actions in August. The first is a request from the University of the Andes to use the FE examination as a component of their educational assessment program. The second is a proposed agreement to assist Kuwait with the development of examinations in accordance with current Council policies.

As you can see, it has been a busy year. Looking back I can see the progress we have made, for which I thank you. Looking forward, I see the progress we still need to make. I appreciate the dedication and hard work of the volunteers and the staff of this great organization. A special thanks goes to our Executive Director, Betsy Browne. The continued personal growth and dedication of our staff over the year has been inspirational.

I thank you for this opportunity to serve the Council.

President's Report—1999
Dale W. Sall, P.E., L.S.

The 2000 committee reports reveal the dedication and effort members devote to the Council throughout the year. It is rewarding to see what the committees have accomplished. All of you are volunteers and achieve much in spite of full-time careers that require the majority of your time. I say a heartfelt "thank you" to each and every one of you for your part in Council activities.

The 2000 interim zone meetings were a good time of discussion, and I hope Council and committee leadership addressed each question and concern that delegates raised. I look forward to the Annual Business Meeting as a chance for more good discussion and great decision making on many issues.

Based on the straw votes at the 1999 Annual Meeting, I directed the Special Committee on Governance and the Constitution and Bylaws Committee to present only the issues needing change at that time. The committees have brought forward 65 motions to make these changes, and based on discussions at the zone meetings, it seems they made good decisions and addressed the issues in a favorable way. I look forward to the Council's taking a positive stance on these items.

Under the direction of the Advisory Committee on Council Activities (ACCA), NCEES staff is preparing a policies and procedures manual to follow the guidelines laid out by last year's committee. It is a huge task and is moving along well.

At the 1999 Annual Meeting, the Council moved that the Computer-Based Testing Oversight Group should proceed with Phase I and report back to the Council with its results this year. The oversight group determined after outlining a scope of work that Phase I could not be completely accomplished in one year. Based on the group's recommendation, the Board of Directors approved extending Phase I to two years so that the Council could make a decision based on sound facts and data. There will be a report on Phase I to date at the meeting this year, and the Council will decide in 2001 whether to proceed with CBT development.

The Mobility Task Force made great strides this year toward identifying mobility impediments and presented its conclusions and recommendations at each zone meeting. The presenters described how mobility might improve and provided examples of what some boards are already doing that we could take home and share with our boards. Many of the mobility issues require us as board members

to do some soul searching as to whether we might be part of the mobility problem. I hope each one of you will think long and hard about this issue, and as a result I believe improvements will be made.

The Council gave the FE Examination Effectiveness Task Force a large task, and the members handled it well. They amassed large volumes of data and participated in many hours of discussion. The task force has determined that the Fundamentals of Engineering (FE) exam, which is designed for determining minimum competency for licensure, can also be used as an assessment tool for engineering schools. Based on this and the Council vote to promote the FE for outcomes assessment, the white paper prepared last year by Dr. Kenneth White and others was distributed to 12,000 faculty, deans, and board members. This year Dr. White has made presentations at a number of convocations explaining how the results of the exam can be used for assessment. The presentations have been well accepted and have elicited many questions, which is a good start on our promotional activities.

The Experience Evaluation Committee came up with a set of guidelines to use in evaluating experience and also some suggestions on mentoring. I expect that the committee will fine tune what it has prepared and add many new things in the years to come.

I am proud to say that I believe the Board of Directors truly worked together this year attempting to resolve all matters in the best interest of the Council. One item in particular that I think was a major accomplishment was the Board's development and adoption of a Board of Directors conflict of interest policy. To that end, I wish to thank all the members of the Board of Directors for their hard work and dedication this year on the Council's behalf. I also thank Council membership for putting forward the excellent caliber of people that I now have the privilege to count as friends as well as fellow board members. It impresses me that the Council is full of willing volunteers and that they freely give of their time and effort for the betterment of the Council.

There are always special people in a new experience or job, and Past President Andrew Liston and his wife Stephanie are two people who will always have a place in my heart. They acted as mentors for Diana and me and were superb at that job. Andrew's help made my transition to President this year much easier. We will consider them friends long after our NCEES days are finished.

I wish to thank Betsy Browne and Council staff; they are a remarkable group. They have made my year a pleasant experience because they always had the information I needed almost before I asked and always had a smile to greet me. I have gotten to know Betsy not only as a truly professional Executive Director, but also as a friend who was always there when I needed a hand in any way. Once again, thanks to the whole staff for the positive attitude they convey to all of us on a daily basis.

I have enjoyed my year as President but as I said last year, I had a lot to learn and I am sure I still have much more to learn in the future about Council affairs. I have represented you to the best of my ability and am somewhat saddened by the fact that I didn't reach some of my goals this year. On the positive side we must set our goals high so that we have something for which to strive.

Lastly, I want to thank all of you—Council membership—for the opportunity you afforded me to serve in this position. You gave Diana and me the opportunity to get to know many of you and to be able to call you friends. As we traveled around the country your hospitality was grand, and we will look back on this year with memories to last a lifetime. Thank you for this opportunity.

President's Report—2000
Andrew B. Liston, P.E., P.L.S.

This report of my year as President is being written in May when most of the committees have completed work and will soon be reporting. Examinations have been and will be administered. All the other activities of the Council continue.

As I write this report, I find that it has been a quiet year. To say that, however, will not do justice to the great things that have been accomplished. The President is the starting gun for the year-long race of the Council's business. I was able to start or continue various processes and have been able to watch as our many volunteers have produced the necessary work.

I cannot say often enough how much I appreciate the sacrifices the members make in volunteering their time. People offer their hours, days, or weeks to carry on activities that I refer to as "paying one's dues." We have come to the NCEES via a gubernatorial appointment that charged us with protecting the public. We use the vehicle of the Council as a means of extending that charge to act on behalf of the country.

I wrote recently of the Interstate Highway System and of how the issue of home rule hindered the execution of the original plan to connect the states with an emergency highway. I believe that the recent activities in the Council and requests of the Council have shown some parallels to that highway system. Throughout the history of the Council, we have attempted to bring the Member Boards closer together through uniformity of an educational accreditation system and of an examination system.

During the last few years, the globalization of the practice of engineering and surveying has made us realize how small the world is. We are beginning to realize that our licensing model is different or unique in the community of the world's licensure and registration systems. We believe it to be the correct system or model, but we are being challenged on many fronts.

In many respects, this has been a year where we have cleaned our eyeglasses and looked in depth at how we are organized and how we work. It has been a year where we started with a clean sheet of paper and have generated proposals. I know that we will act on the proposals by setting aside our Member Board hats in favor of acting on behalf of the whole Council.

As a part of the reporting of the results of the actions of committees and the studies, we held a number of discussions at the zone meetings. This has been a year when these meetings have been held without substantial conflict but with substantial discussion of serious items. All the items are the subjects of reports to the Council and were discussed at each of the zone meetings. I will concentrate here on the three that I feel are the most important to the Council's future.

Governance/Constitution and Bylaws—The Council has not previously performed such an in-depth review of its constitution, bylaws, and procedures as it has during the last 2 years. Steve Schenk began the process of studying our governance structure, leading up to the town meeting discussion at the last Annual Meeting. Since that time, the Governance Committee has continued to study the ways in which the Council acts and wishes to act.

The governance process has accomplished many things that have benefited the Council. Primarily, it has allowed us to determine what is important to the people who participate in the decisions of the Council. Through the various discussions and reports, everyone has been able to make opinions known. The Governance Committee has continued to listen to the opinions and to refine the proposals to reflect the wishes of Council members.

I sent the proposals resulting from the governance review process to the Committee on Constitution and Bylaws. The committee has organized them into a format that is appropriate for

action in August. While there will be many motions on which to act, the concepts underlying all have been discussed in depth. Many changes are of a housekeeping nature, while others are not.

I will be pleased and gratified if the votes taken at the Annual Meeting result from a careful reading by individuals who can and do think about the Council as a whole and not about a particular board or a particular set of state laws or regulations.

Policies—The Advisory Committee on Council Activities (ACCA), in conjunction with the Committee on Finances and the examination committees, conducted a thorough review of Council policies and has proposed a rearrangement of these policies. ACCA found that, in the past, the Council has created and placed policies into the policy manual without regard to the effect that such placement might have. The ACCA proposal keeps the policy text but rearranges it to be in more appropriate locations. There would still be professional, administrative, and financial policies, but the committee would also add position statements and a procedural manual to the list of Council documents. Proper things in proper places.

The committee's action is another example of the introspective look that has been a part of this Council year. It will be important to carefully review the proposal with the filter of the Council's best interest and of common sense.

Computer-Based Testing—The issue that may have the largest impact on the Council and the world of licensure is that of computer-based testing (CBT). The task force that began with a single Member Board's motion at a zone meeting is reaching the floor at the Annual Meeting this year. The active study that began with a subcommittee of the Committee on Examination Policy and Procedures and moved to an independent task force has resulted in a report and motions to move forward.

While this activity may have started at a zone meeting in 1996 where the emotion of the vote won the day, the action at the Annual Meeting must be based upon an evaluation of the facts as presented in the CBT Task Force report. The actions will set in motion a step in the collection of those data that will provide many of the missing answers to the questions raised during the study.

During my 12 years of activity with the NCEES, I have met and worked with many people I consider to be friends. I have worked with many people who have expressed opinions different from mine. I have worked with many people who have given of themselves unselfishly. As I have often said, the Council is filled with "good people." I am fortunate to have become acquainted with so many of them.

I have many thanks to give. I again thank the members of the Council for their willingness to serve their Member Boards and the Council. Without them, there would be no Council.

I thank all the members of the Board of Directors. The Council and the President require a board in order to carry out the necessary activities between Annual Meetings. I challenged this Board to work together, to accomplish a lot, and to come to decisions by consensus. I believe that the Board accepted its challenges, completed its work, and was successful.

I thank Steve Schenk for the time I had as President-Elect, learning many of the necessary presidential activities and meeting many of the Council and collateral organization people. I also thank him for the counsel and continuity he provided to me and to the governance review process this year.

I thank Dale Sall for being elected President-Elect. I will be leaving this position in good hands. Soon, he will begin to enjoy the flurry of mail, e-mail, invitations, calls, and all the other aspects of leadership that occupy the President. I hope that this year has provided to him what my year as President-Elect provided to me.

I thank Betsy Browne and the Council staff. I commend them for the accomplished and professional manner that I could always depend on. The Council members should realize how important our staff has been in keeping our business running smoothly. In the midst of the varying and changing opinions voiced individual to individual or zone to zone, the staff is a constant source of reference for all, ready to be of assistance. I very much appreciate the positive attitudes exhibited by the staff members throughout the year.

I have enjoyed my year as President, but, as a number of my predecessors have stated, it is a bittersweet time. It takes about three-quarters of a year to figure out how to do the job properly, but by that time, the majority of the work has been completed. It has been an extremely busy year. I have been pleased by some of the actions and progress that I have witnessed.

Although some of the changes recommended by individuals, committees, and task forces have not been fully supported, I continue to hope that the Member Boards and members will become even more aware of the importance of working together as a truly national Council. I continue to challenge each one of you to grow in your knowledge and understanding of the issues facing the whole of the NCEES as we move toward the next century.

I thank you all for the opportunities I have had to get to know you better. When Stephanie and I traveled to your areas, we appreciated the great hospitality so many of you extended to us. We will look back on this year with many good memories of our times together.

President's Report—2001
J. Richard Cottingham, P.E., P.L.S.

As my term as President began, I identified four primary goals for special focus during 2000–2001. In addition, engineering licensure qualifications emerged as a major issue, and I am happy to report that significant progress has been made on all fronts, including other important emerging issues as well as the routine activities of the Council.

In the area of exams, we successfully administered the first two breadth/depth exams in civil engineering, with mechanical and electrical breadth/depth exams poised to follow within the next year. Several Professional Activities and Knowledges Studies (PAKS) are in various stages of progress, the computer-based testing (CBT) study reached a successful interim milestone, and the fundamentals exam is receiving much broader acceptance as an outcomes assessment tool.

More jurisdictions are taking a serious look at their laws and rules concerning mobility/comity than ever before. A straw poll taken at the Board Presidents/Member Board Administrators (MBAs) Assembly showed that more than 30 jurisdictions are now expediting Model Law Engineer comity applications. Council Records Program acceptance is at an all-time high, and one state is even considering a reduced application fee for those who hold a Council Record. Council staff has made significant progress toward developing online access to transmitted Records, and the resulting capability for "one-day, online" comity licensure effectively makes "national registration/state licensure" a reality.

Developments in promotion of licensure have begun to have a major impact. We have gathered significant market research with valuable insight into the attitudes of undergraduates and those who influence them. The Licensure Promotion Task Force has brought together several organizations with an interest in promoting engineering as well as the value of licensure. The effectiveness of our future activities and projects will surely be enhanced by coordinating with these like-minded organizations. Initiatives such as Engineering and Land Surveying Examination Services (ELSES),

which provide additional services to Member Boards while providing additional revenue to the Council, have also been very successful.

A draft of our updated Strategic Plan has been prepared by the Advisory Committee on Council Activities after extensive effort by the Board and staff and input from over 200 Council members. The plan includes very broad goals and incorporates flexibility to make changes to specific objectives and tasks over time. The draft plan was presented at the spring zone meetings and received favorable comments.

For me, the most significant undertaking during my presidency was establishment of the Engineering Licensure Qualifications Task Force (ELQTF). The task force is in the process of conducting a comprehensive evaluation of our model for engineering licensure. My decision to proceed with establishment of the task force resulted from numerous questions that have surfaced which indicate that licensure and our licensure model may not be as relevant today as in the past. Our system has served us well, and I believe it adequately allows the Member Boards of NCEES to carry out their primary responsibility of public protection; however, I think the time has come to take a zero-based look at our model to make sure that it is relevant in view of the emerging changes of the 21st century. Membership of the task force includes representatives from over twenty professional and technical organizations, and the study is expected to last several years. If significant changes in our model result, implementation could then take another extended period of time as Member Boards adopt the new model. The activities of the ELQTF have been publicized widely, and all feedback concerning the activities has been extremely positive.

All the success that the Council has experienced over the past year has been the result of thousands of hours of hard work by hundreds of dedicated members and staff. All committees have done an outstanding job, and state board staffs, under the leadership of extremely capable MBAs, have also performed admirably. The performance of the NCEES staff has been particularly outstanding and is due in large part to the splendid leadership provided by our Executive Director, Betsy Browne.

I am very comfortable passing the gavel to Ted Fairfield. Ted is quite capable and is extremely committed to NCEES. I am confident that under his leadership, Council activities will continue on a positive note as we enter the next year.

I appreciate very much the opportunity that you have given me to serve as your President, and I thank all of you for the support you have provided over the past year. I have strived to fulfill my commitment to "carry out the will of the Council," and will always feel a sense of deep reward from being a part of this great organization. Nancy and I will remember forever the friendships that we have made and look forward to a lifetime of continuing relationships with all of you.

President's Report—2002
Ted C. Fairfield, P.E.

I am writing this report at the end of May, which is a time of both heavy travel and heavy reading for the NCEES President. The travel is due to the four zone interim meetings (just completed), followed by annual meetings of a number of other associations with which NCEES maintains liaison arrangements, such as the Canadian Council of Professional Engineers (CCPE), the United States Council for International Engineering Practice (USCIEP), the American Council of Engineering Companies (ACEC), the National Council of Architectural Registration Boards (NCARB), and the National Society of Professional Engineers (NSPE). The reading is of a stack of very pregnant committee reports. This is also the first time, as President, that I have been able to really reflect upon "what's been happening" during my term.

If this year has been any different than those in the recent past, I think it can be characterized by the following:

1. A clearer realization (as I have stated in a recent article in *Licensure Exchange*), that NCEES is not an "island." NCEES provides services to its Member Boards and cannot dictate to them, though it must do its best to help lead them in what becomes an informed, collective view of the "right direction."
2. Not being an island means that NCEES cannot work in a vacuum; that is, it must work both proactively and reactively with and to the ideas, pressures, demands, and sometimes contrary views and actions of other stakeholders in the "licensure world." While we might love to have "control" over certain policies of the Accreditation Board for Engineering and Technology (ABET), we do not have it and must rely upon liaison efforts to maximize our influence. While we would like to have ACEC, the American Society of Civil Engineers (ASCE), and many other groups become more "understanding" of licensure and supportive of all of NCEES's goals and activities, again, we cannot expect anything near perfection and must rely upon ongoing dialogue. While we would like to have all engineering and surveying students commit themselves early in their education to the licensure track, we have not yet figured out the magic key to success in that realm. But, we do know that outreach, liaison efforts, and licensure promotion are essential to success in all of the above-stated examples. For these reasons and many more, you will find that NCEES has become much more active in the outreach, promotion, and liaison arenas.
3. Perhaps best exemplified by the Engineering Licensure Qualifications Task Force (ELQTF), created by Past President Cottingham, most of the Council's recent activities and projects are now multiyear in nature. There is little desire or opportunity for a given President to conceive and assign projects that can be accomplished within his or her term. This causes Presidents to think of larger goals, all for the betterment of the Council, I hope.

This year, ELQTF has made some major strides and should continue to do so for the next couple of years. A number of mobility/comity issues that have been simmering should come to a head in August, via the Committee on Uniform Procedures and Legislative Guidelines (UPLG) and the Individual and Business Comity Task Force. The Structural Engineering Examination/Recognition Task Force was formed this year, and I hope its well-reasoned conceptual proposals will be blessed by the membership at the Annual Meeting. With the October 2002 administration, the engineering examination development committees will complete the transition of all exams (but for Structural II) to the no-choice (and in some cases, breadth/depth) formats. The Advisory Committee on Council Activities (ACCA) tackled a number of issues this year, detailed in its report to the Council, including a potential name change for the NCEES. The Licensure Promotion Task Force has made substantial progress, and the Council is now "exhibiting" at a whole variety of technical and professional society meetings, something that was unheard of just a year or two ago. The Task Force on Model Law for Surveying has come together with its proposed inclusive format for surveying licensure. A special Group II Task Force was created this year to deal primarily with the financial and psychometric problems arising from low usage of some of the Council's exams. That task force's recommended actions are primarily found in the report from the Committee on Examination Policy and Procedures (EPP).

I must also mention that two new task forces have been created this year to deal with some serious and ongoing problems with the examination program. First, the Examination Security Task Force was formed to reduce/prevent serious financial and volunteer-hour losses in the examination program. NCEES has experienced such losses from a variety of causes ranging from lax examination administration, traditional and high-tech cheating, bad luck, and criminal theft of exams, to exams and answer sheets being lost in the shipping process. This new task force has some critically important work in front of it.

Second, the "Exam Splintering Hit Team" (likely a temporary name) has been formed to divine initial, conceptual solutions to problems that are only now showing up on the Council's radar screen. The initial purpose of this group was merely to try to conceive of imaginative, new methods to deal with the low number of takers of some exams, especially the newer Group II exams that arise from the splintering of traditional disciplines. Recent events have caused that team to also be asked to try to anticipate, conceptually, how the Council's exam programs can/should react to ABET's recent softening of its heretofore prescriptive Engineering Accreditation Commission (EAC) core curricula for many engineering programs, and also how to deal with the apparently burgeoning growth of bioengineering programs—where the operative sciences will be biologically based instead of physics based.

Finally, I would like to thank the very many people who have performed prodigious amounts of work (quality and quantity) this past year on behalf of the Council. Perhaps Jim McCarter and the key players in his UPLG Committee best exemplify the magnitude of accomplishments—just take a look at their committee report—but virtually every individual and every committee operated at true P.E. and P.L.S. levels of performance. Included in that special thanks are each and every member of the Board of Directors, Betsy Browne, and her key staff members.

Thanks to all of you from both Gail and me for an opportunity of a lifetime. We learned lots, experienced much, saw places that we would never have visited otherwise, and developed some serious friendships. I look forward to a more relaxed year in my "of counsel" position as Past President. You will definitely enjoy working with your new President Bob Krebs. Bob is a person to whom I am totally comfortable in "passing the gavel."

President's Report—2003
Robert C. Krebs, P.E., L.S.

It certainly is not an easy task to reduce one of my most rewarding professional years to a one-page narrative. I did scan previous President's reports, searching for tidbits that might be apropos, but those reports dealt with past years, and now we are halfway though 2003. The Council's issues are real, and I must say that a good sense of humor is essential.

Before my obligatory summary of the Council activities over the last year, I would like to issue one more very serious and sincere thank you to all who have contributed, committed, and sacrificed to and for the Council this last year: to the Board of Directors for the diligence, hard work, and willingness to make uncomfortable decisions; to the committee chairs for being leaders and cat herders; and to the countless volunteers for doing the work of the Council, plugging away with little or no recognition, and giving of yourself to your profession and making things better. I also cannot leave out the Council staff for their dedication and for their true professionalism, all of which is a reflection of our Executive Director, Betsy Browne. Thank you all.

Last year at this time I promised "nothing new" and promised to keep the Council moving forward with a positive attitude. This was not an empty covenant, albeit difficult to measure or quantify, and I think we have had some success.

Perhaps the most interesting and anticipated activity scheduled for the Annual Meeting is the presentation of the report from the Engineering Licensure Qualifications Task Force (ELQTF). Since its inception in late 2000 and under the superb leadership of Jon Nelson, this task force has completed an in-depth evaluation of the current requirements for licensure and will present its recommendations in August. With the Council's consent, these recommendations will be studied by a new committee, the Licensure Qualifications Oversight Group (LQOG), which will present action items to the Council for adoption some time in the future. Of particular interest with the ELQTF report is the fact that it represents a very broad consensus of the engineering profession.

A number of years ago the Council studied computer-based testing (CBT), and a result of that process was a finding that very few college students had any knowledge of or appreciation for licensure. A recent licensure promotion effort culminated with the unveiling in February of the NCEES Speaker's Kit. This very professional product has been successful and has made an impact on undergraduates' awareness of licensure.

Since 1997 the Council has had a Strategic Plan that has gradually become irrelevant, and not necessarily coincidental with the Council's direction. After several years of research and study, the Advisory Committee on Council Activities (ACCA) has prepared a new Strategic Plan and will present it at the Annual Meeting in August. This plan represents years of hard work and input from many surveys and workshops.

In 1995 the Council revised the definition of land surveying to include photogrammetry. This resulted in a ripple effect and spawned a number of committees and task forces that have studied and evaluated the *Model Law*. After at least two more studies and revisions, a final proposal for changes to the *Model Law* will be presented for adoption at the Annual Meeting.

All of our exams except Structural II are now in a multiple-choice, objectively scored format. This monumental effort has been successful because of the dedication and diligence of many volunteers. Our Fundamentals of Engineering (FE) examination continues to gain credibility as one of the few objective measures of learning and as an outcomes assessment tool. The Council is now undertaking a content review of the FE examination to ensure it remains relevant to industry, academia, and licensure needs. Several Professional Activities and Knowledge Studies (PAKS) are in progress, including one for the surveying profession. We also took a critical look at some of our exam processes this past year.

Our contact with the surveying profession was enhanced this year and included a face-to-face meeting with the leadership of the American Congress on Surveying and Mapping (ACSM) and the National Society of Professional Surveyors (NSPS). There is renewed vigor for the Council to partner in surveying activities such as Trig-Star and National Surveyor's Week and to provide forum opportunities at the Annual Meeting.

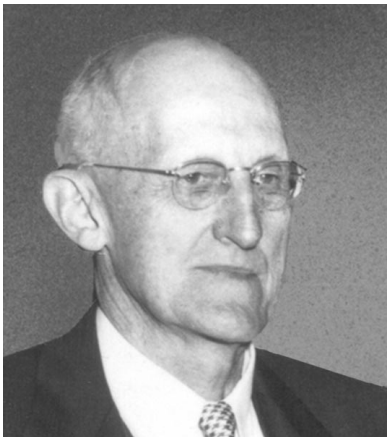
Two initiatives were started this year partially because of the results of the strategic planning surveys. While education and the requirements for licensure were studied by ELQTF, the Council has no formal position or policy on education. NCEES *Model Law* requires a degree accredited by the Engineering Accreditation Commission of ABET (EAC/ABET), but with the many issues surrounding education and accreditation, the Council needs to formally adopt positions with regard to the same. In addition, our exams and their security have been identified as a top strategic objective. The Council must enhance security to protect its most valued resource.

Serving the Council as President has been an opportunity of a lifetime for me. Support, kindness, friendship, understanding, and tolerance are all overused terms, but I know no other way of

expressing my sincere appreciation for everything everyone has done for Sally and me. I have officially declared that the office of the Past President shall now be known as the "heckler," and I intend to enjoy that role. For those who have invited us to "stop by sometime," heads up!

Lastly, my deepest thanks are saved for Sally, my wife and best friend.

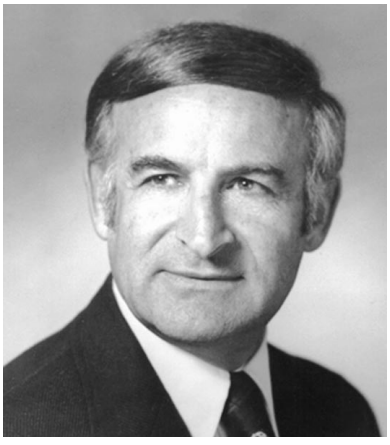
Appendix 3
Executive Directors



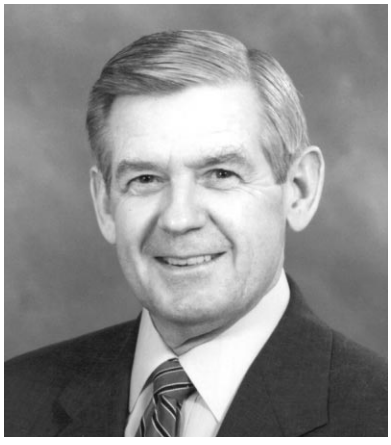
T. Keith Legaré
1921–1960

James H. Sams
1960–1970

Walter J. Edelblut, Jr.
1971–1975



Morton S. Fine
1976–1981



Roger B. Stricklin, Jr.
1982–1995

F. Elizabeth Browne
1995–present

Appendix 4
Member Boards

Date indicates year licensing law enacted.

Central Zone

Illinois PE 1945
Illinois LS 1939
Illinois STR 1915
Indiana PE 1921
Indiana LS 1921
Iowa 1919
Kansas 1931
Michigan PE 1919
Michigan LS 1963
Minnesota 1921
Missouri 1941
Nebraska PE 1937
Nebraska LS 1957
North Dakota 1943
Ohio 1933
South Dakota 1925
Wisconsin 1931

Northeast Zone

Connecticut 1935
Delaware PE 1941
Delaware LS 1930
D.C. 1950
Maine PE 1935
Maine LS 1967
Maryland PE 1939
Maryland LS 1977
Massachusetts 1941
New Hampshire PE 1945
New Hampshire LS 1969
New Jersey 1921
New York 1920
Pennsylvania 1921
Rhode Island PE 1938
Rhode Island LS 1990
Vermont PE 1939
Vermont LS 1969
Virginia 1920
West Virginia PE 1921
West Virginia LS 1969

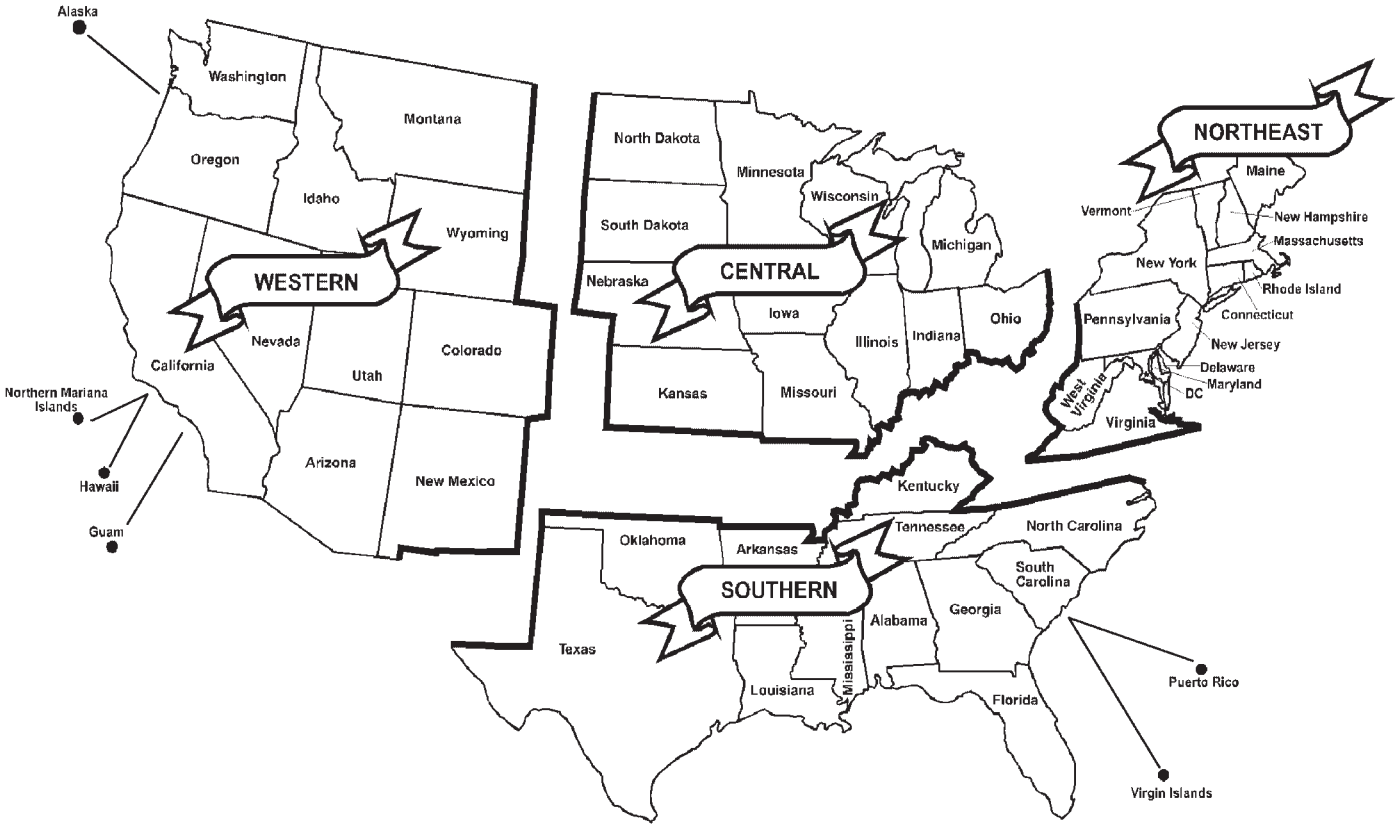
Southern Zone

Alabama 1935
Arkansas 1925
Florida PE 1917
Florida LS 1931
Georgia 1937
Kentucky 1938
Louisiana 1908
Mississippi 1928
North Carolina 1921
Oklahoma 1935
Puerto Rico 1927
South Carolina 1922
Tennessee PE 1921
Tennessee LS 1969
Texas PE 1937
Texas LS 1955
Virgin Islands (US) 1968

Western Zone

Alaska 1939
Arizona 1921
California 1929
Colorado 1919
Guam 1960
Hawaii 1923
Idaho 1919
Montana 1947
Nevada 1919
New Mexico 1935
Northern Mariana Islands . . 1978
Oregon 1919
Utah 1935
Washington 1935
Wyoming 1907

Appendix 5
Zone Organization



Appendix 6
Number of Engineering Licenses in the United States

	Total Number of Engineering Licenses	Nonresident Licenses	Resident Licenses
1937	46,812	3,328	43,484
1938	57,850	3,703	54,147
1939	62,406	4,694	57,712
1940	67,286	5,670	61,616
1941	67,817	8,350	59,467
1942	No *Proceedings* issued in 1942—No Meeting		
1943	72,804	9,307	63,497
1944	73,532	11,378	62,154
1945	No *Proceedings* issued in 1945—No Meeting		
1946	92,905	14,054	78,851
1947	114,698	16,733	97,965
1948	130,620	19,807	110,813
1949	153,277	21,959	131,318
1950	159,759	25,626	134,133
1951	167,414	28,200	139,214
1952	176,533	28,294	148,239
1953	184,655	33,196	151,459
1954	191,553	33,407	158,146
1955	201,633	39,585	162,048
1956	214,357	43,500	170,857
1957	226,371	46,702	179,669
1958	237,244	54,271	182,973
1959	246,279	60,413	185,866
1960	259,707	66,104	193,603
1961	270,859	67,707	203,152
1962	280,088	70,898	209,130
1963	287,056	73,603	213,453
1964	298,282	80,820	217,462
1965	311,839	98,355	213,484
1966	322,165	103,118	218,047
1967	337,298	95,919	241,381
1968	350,731	108,556	242,175
1969	361,877	115,878	245,999
1970	374,206	125,130	249,076
1971	385,120	105,432	279,688
1972	393,725	108,577	285,148

Total Number of Engineering Licenses	Nonresident Licenses	Resident Licenses
1973	408,286	120,272	288,014
1974	433,404	133,934	318,470
1975	434,297	109,165	325,132
1976	447,005	97,489	349,518
1977	475,387	75,007	400,380
1978	502,184	205,000	297,000
1979	516,354	199,378	316,976
1980	545,000	213,000	332,000
1981	549,000	218,000	331,000
1982	575,000	237,000	338,000
1983	577,000	233,000	344,000
1984	581,000	241,000	340,000
1985	586,000	247,000	339,000
1986	596,000	253,000	343,000
1987	602,000	264,000	338,000
1988	622,000	262,000	360,000
1989	652,516	271,527	380,989
1990	609,267	270,161	339,106
1991	627,032	272,588	354,444
1992	652,410	274,655	377,755
1993	641,383	280,764	360,619
1994	638,238	223,963	414,275
1995	641,041	226,883	414,158
1996	610,153	241,268	368,885
1997	656,235	272,836	383,399
1998	664,840	265,521	399,319
1999	656,710	238,217	373,493
2000	669,627	267,360	402,267
2001	613,617	228,784	384,833
2002	654,370	280,026	374,344
2003	703,137	311,808	391,329
2004	750,596	308,018	*442,578

**Includes 30,391 from two jurisdictions where there is no accurate resident/nonresident breakdown. Three boards did not respond to the survey.*

NOTE: The method of reporting from 1978 to present represents a radical change from that used during the years 1937–1977.

Data as of June 8, 2004

Appendix 7
Number of Licensees by Jurisdiction

	Engineers		Land Surveyors		Engineers and Land Surveyors	
	Resident	Nonresident	Resident	Nonresident	Resident	Nonresident
AL	4,822	6,356	555	267	272	53
AK	1,891	1,884	421	132	98	13
AR	2,023	3,914	401	234	84	24
AZ	6,975	13,921	1,474	1,318	N/A	
CA	64,570	22,547	3,225	771	507	65
CO	N/A		N/A		N/A	
CT	N/A		N/A		N/A	
DE	1,339	4,480	94	114	N/A	
DC	357	3,076	5	47	N/A	
FL	17,241	12,390	2,866	357	N/A	
GA	15,228	N/A	1,208	N/A	N/A	
GU	130	220	18	4	1	0
HI	2,798	1,626	168	16	N/A	
ID	1,974	3,666	259	328	94	50
IL	12,017	8,683	1,110	320	N/A	
IN	14,102	N/A	862	N/A	N/A	
IA	2,272	4,249	194	99	151	32
KS	4,162	5,026	521	264	351	71
KY	3,521	7,446	612	396	659	115
LA	4,873	5,904	637	146	333	66
ME	2,500	4,000	434	125	N/A	
MD	5,898	8,360	258	138	134	
MA	N/A		N/A		N/A	
MI	11,193	9,040	921	112	N/A	
MN	6,004	4,212	387	52	89	22
MS	1,733	6,932	293	582	419	486
MO	7,560	7,620	640	240	N/A	
MT	1,316	2,346	202	158	49	19
NE	2,066	3,321	211	62	20	16
NV	2,360	5,408	402	491	58	42

	Engineers		Land Surveyors		Engineers and Land Surveyors	
	Resident	Nonresident	Resident	Nonresident	Resident	Nonresident
NH	1,764	3,638	279	124	N/A	
NJ	9,128	9,206	868	213	277	42
NM	2,086	3,908	264	179	83	21
NY	15,764	11,668	1,456	258	181	
NC	8,155	3,561	1,868	399	473	83
ND	2,336	1,622	106	105	40	14
NMI	21	122	7	6	0	1
OH	16,054	15,580	1,504	381	915	220
OK	4,227	5,641	326	151	105	20
OR	5,713	9,846	1,236	529	248	62
PA	17,126	14,082	2,531	644	N/A	
PR	10,236	900	485	10	104	12
RI	793	2,234	131	80	34	8
SC	4,396	8,042	551	366	148	43
SD	677	1,850	83	154	84	17
TN	6,444	6,192	853	270	11	1
TX	37,464	11,993	3,062	161	N/A	
UT	6,997		655		N/A	
VT	826	2,763	162	80	N/A	
VA	22,424		1,329	N/A	N/A	
VI	68	84	16	5	2	0
WA	12,420	7,628	818	274	255	94
WV	1,562	4,239	N/A		N/A	
WI	9,490	9,710	1,082	511	N/A	
WY	941	3,258	127	182	85	57

Appendix 8
Past Award Recipients

*P. H. Daggett	New Jersey	DSA	1938
*Paul Doty	Minnesota	DSA	1938
*L. M. Martin	Iowa	DSA	1938
*C. T. Olmstead	Michigan	DSA	1938
*T. Keith Legaré	South Carolina	DSA	1940
*G. M. Butler	Arizona	DSA	1943
*M. E. Chamberlin	Minnesota	DSA	1943
*A. B. Clemens	Pennsylvania	DSA	1943
*Donald Derickson	Louisiana	DSA	1943
*N. W. Dougherty	Tennessee	DSA	1943
*L. S. LeTellier	South Carolina	DSA	1943
*C. G. Massie	Virginia	DSA	1943
*Frank W. McKellip	Minnesota	DSA	1943
*Virgil M. Palmer	New York	DSA	1943
*B. W. Pegues	Louisiana	DSA	1943
*J. C. Remington, Jr.	New Jersey	DSA	1943
*H. S. Sands	Colorado	DSA	1943
*W. D. Tyler	Virginia	DSA	1943
*V. O. Wallingford	Arizona	DSA	1943
M. C. Hinderlider	Colorado	DSA	1944
Hugh A. Kelly	New Jersey	DSA	1944
James Underhill	Colorado	DSA	1944
*Thomas H. Allen	Tennessee	DSA	1946
*William C. Fuerer	Hawaii	DSA	1946
Fred E. Ruediger	Virginia	DSA	1946
*J. S. Dodds	Iowa	DSA	1947
*S. H. Graf	Oregon	DSA	1947
*B. H. Grehan	Louisiana	DSA	1947
*C. L. Mann	North Carolina	DSA	1948
*Erich Hausmann	New York	DSA	1949
*D. B. Steinman	New York	DSA	1949
*R. V. Achatz	Indiana	DSA	1950
*Theodore L. Condron	Illinois	DSA	1950
*Owen M. Jones	West Virginia	DSA	1950
*N. T. Kinzly	Tennessee	DSA	1950
C. A. Halbert	Wisconsin	DSA	1951
*H. D. Mendenhall	Florida	DSA	1951
*R. A. Seaton	Kansas	DSA	1951

*L. L. Patterson	Mississippi	DSA	1952
*W. W. Graf	Ohio	DSA	1953
*A. G. Proctor	California	DSA	1953
*Hal G. Sours	Ohio	DSA	1953
*C. C. Knipmeyer	Indiana	DSA	1954
*George M. Shepard	Minnesota	DSA	1954
C. E. Davies	New York	DSA	1955
*J. M. Gallalee	Alabama	DSA	1955
*Marcel Garsaud	Louisiana	DSA	1955
*W. W. Hodge	West Virginia	DSA	1955
*D. B. Jett	New Mexico	DSA	1955
*H. T. Person	Wyoming	DSA	1955
*W. K. Simpson	Connecticut	DSA	1955
*M. K. Snyder	Washington	DSA	1955
Joseph Weil	Florida	DSA	1955
*C. S. Crouse	Kentucky	DSA	1956
*C. L. Eckel	Colorado	DSA	1956
*J. D. Guillemette	Rhode Island	DSA	1956
*Allen S. Janssen	Idaho	DSA	1956
*Junius T. Moore	West Virginia	DSA	1956
*Stanley G. Palmer	Nevada	DSA	1956
*William M. Spann	Missouri	DSA	1956
*Russell G. Warner	Connecticut	DSA	1956
*Alexander Blair	Florida	DSA	1957
*O. B. Curtis, Sr.	Mississippi	DSA	1957
*N. L. Freeman	New York	DSA	1957
*J. W. Gore	Maryland	DSA	1957
T. E. Heathcote	New Jersey	DSA	1957
A. L. Jones	New Jersey	DSA	1957
Frank H. Prouty	Colorado	DSA	1957
*E. S. Rankin	Minnesota	DSA	1957
*James H. Sams	South Carolina	DSA	1957
*A. G. Stanford	Georgia	DSA	1957
*Thomas C. Shedd	Illinois	DSA	1957
H. L. Solberg	Indiana	DSA	1957
*Carl L. Svensen	Texas	DSA	1957
Robert N. Waid	Ohio	DSA	1957
*Bruce Williams	Missouri	DSA	1957
*Edward C. Dohm	Washington	DSA	1958
*Roy M. Green	Nebraska	DSA	1958
Robert C. Gorham	Pennsylvania	DSA	1958
*Bryant L. Hopkins	Maine	DSA	1958
Robert C. Johnson	Wisconsin	DSA	1958

Philip S. Mancini	Rhode Island	DSA	1958
*H. T. McGaughan	Michigan	DSA	1958
N. J. McGuinness	New Jersey	DSA	1958
*Lewis S. Neeb	Arizona	DSA	1958
*A. J. Shaver	Nevada	DSA	1958
*E. R. Stapley	Oklahoma	DSA	1958
*L. T. Bohl	Rhode Island	DSA	1959
*E. A. Buckhorn	Oregon	DSA	1959
*Albert Haertlein	Massachusetts	DSA	1959
*Gwynne B. Hill	Oklahoma	DSA	1959
William H. Larkin	New York	DSA	1959
*W. C. Polkinghorne	Michigan	DSA	1959
*L. M. K. Boelter	California	DSA	1960
*Raymond J. Briggs	Idaho	DSA	1960
*Walter E. Bryan	Missouri	DSA	1960
*Moses E. Cox	Georgia	DSA	1960
*L. E. McCartt	Kentucky	DSA	1960
*A. L. McCawley	Missouri	DSA	1960
Robert J. Rhinehart	Arkansas	DSA	1960
*Lucius D. Barrows	Maine	DSA	1961
*Frank Beard	Missouri	DSA	1961
*Arnold L. Henny	Oregon	DSA	1961
Julian Wylly Keck	Florida	DSA	1961
*Clifton C. Cobb	Alabama	DSA	1962
Arnold M. Steffes	Minnesota	DSA	1962
*Robert Williamson, Jr.	West Virginia	DSA	1962
*Weston S. Evans	Maine	DSA	1963
John S. Jamison, Jr.	Virginia	DSA	1963
Leo M. Odom	Louisiana	DSA	1963
*Clarence H. Evans	Delaware	DSA	1964
William H. Lesser	Pennsylvania	DSA	1964
*Arvin Page	North Carolina	DSA	1964
Roswell H. Towill	Hawaii	DSA	1964
Harry D. Watson	Maine	DSA	1964
*W. Morgan Allen	Oregon	DSA	1965
*Chester A. Arents	West Virginia	DSA	1965
*John W. Beretta	Texas	DSA	1965
*Ben T. Bogard	Louisiana	DSA	1965
Walter D. Emerson	Vermont	DSA	1966
*Orland C. Mayer	Idaho	DSA	1966
*Leo W. Ruth, Jr.	California	DSA	1966
Arthur E. Adami	Montana	DSA	1967
John B. Carson	Delaware	DSA	1967

David E. Fields	Oklahoma	DSA	1967
*Donald E. Marlowe	D.C.	DSA	1967
Francis R. Montgomery	Hawaii	DSA	1967
*Anthony L. Bavone	North Dakota	DSA	1968
Glenn L. Enke	Utah	DSA	1968
James A. McCarthy	Indiana	DSA	1968
*William H. Rowan	Tennessee	DSA	1968
Ralph H. Wallace	Iowa	DSA	1968
*Edwin R. Whitehead	Illinois	DSA	1968
Jesse Coates	Louisiana	DSA	1969
*Edward Donovan	New Hampshire	DSA	1969
Arthur D. Hughes	Oregon	DSA	1969
*Herman A. Moench	Indiana	DSA	1969
*George F. Branigan	Arkansas	DSA	1970
*William S. Kelley, Jr.	Minnesota	DSA	1970
Henry L. Kinnier	Virginia	DSA	1970
Robert L. Meek	Indiana	DSA	1970
John H. Morrison	Montana	DSA	1970
*Llewellyn T. Schofield	Massachusetts	DSA	1970
Cornelius Wandmacher	Ohio	DSA	1970
Kurt F. Wendt	Wisconsin	DSA	1970
*Dwight H. Bray	Kentucky	DSA	1971
Eldon R. Dodge	Montana	DSA	1971
James G. McGivern	Washington	DSA	1971
Lawrence Robertson	Colorado	DSA	1971
Harry C. Simrall	Mississippi	DSA	1971
*Richard P. Hankins	Virginia	DSA	1972
Clifford R. Horn	Kansas	DSA	1972
Robert McMurray	Indiana	DSA	1972
*Robert B. Rice	North Carolina	DSA	1972
Earl A. Schilt	New York	DSA	1972
*Roy T. Sessums	Louisiana	DSA	1972
*Paul Weber	Georgia	DSA	1972
Sherwin M. Barton	Idaho	DSA	1973
Harris Bateman	Oklahoma	DSA	1973
George Bruggemeier	Ohio	DSA	1973
*Amos E. Kent	Massachusetts	DSA	1973
*Harry E. Myers	Alabama	DSA	1973
*Frederick H. Rogers, Sr.	Maryland	DSA	1973
*B. L. Baker	South Carolina	DSA	1974
Stanley P. Bartles	New York	DSA	1974
Grant K. Borg	Utah	DSA	1974
Charles H. Coogan, Jr.	Connecticut	DSA	1974

*O. B. Curtis, Sr.	Mississippi	DSA/SC	1974
Harry Czyzewski	Oregon	DSA	1974
Robert D. Reckert	Iowa	DSA	1974
J. Kent Roberts	Missouri	DSA	1974
**H. Sidwell Smith	Idaho	DSA	1974
*Michael Baker, Jr.	Pennsylvania	DSA	1975
Morton S. Fine	Connecticut	DSA	1975
*Orland C. Mayer	Idaho	DSA/SC	1975
Waldemar S. Nelson	Louisiana	DSA	1975
**H. T. Person	Wyoming	DSA/SC	1975
Leo M. Odom	Louisiana	DSA/SC	1975
*Uel Stephens	Texas	DSA	1975
Noel W. Willis	Iowa	DSA	1975
**Loren E. Anderson	Nevada	DSA	1976
*Ben T. Bogard	Louisiana	DSA/SC	1976
George F. Evans	Ohio	DSA	1976
*Christian E. Grosser	Virginia	DSA	1976
**Kenward S. Oliphant	California	DSA	1976
*Llewellyn T. Schofield	Massachusetts	DSA/SC	1976
Franklin E. Smith	Idaho	DSA	1976
Frank J. Viola	New York	DSA	1976
Frank J. Cannizzaro	New Jersey	DSA	1977
Jesse Coates	Louisiana	DSA/SC	1977
Donald C. Klein	Texas	DSA	1977
James Knickerbocker	Arizona	DSA	1977
Andrew M. Moore	Louisiana	DSA	1977
**Hal G. Sours	Ohio	DSA/SC	1977
*O. W. Summers	Indiana	DSA	1977
*Samuel Valencia	Massachusetts	DSA	1977
Walter T. Anderson	Michigan	DSA	1978
**Kenneth E. Esmond	Texas	DSA	1978
C. Dale Greffe	Illinois	DSA	1978
Herbert G. Koogle	New Mexico	DSA	1978
Elbert E. Lewis	Colorado	DSA	1978
Robert L. Meek	Indiana	DSA/SC	1978
*Edward L. Pine	Nevada	DSA	1978
*Roy T. Sessums	Louisiana	DSA/SC	1978
Roger H. Brown	Georgia	DSA	1979
Elmer F. Emrich	Florida	DSA	1979
Ernest B. Gardow	Connecticut	DSA	1979
William J. Hanna	Colorado	DSA	1979
**Amos E. Kent	Massachusetts	DSA/SC	1979
Thomas J. McClellan	Oregon	DSA	1979

*Herman A. Moench	Indiana	DSA/SC	1979
Earl C. Radding	Delaware	DSA	1979
C. Dale Bratcher	Kentucky	DSA	1980
Kenneth R. Daniel	Alabama	DSA	1980
Rudolf A. Jimenez	Arizona	DSA	1980
Fred H. Lyon	New York	DSA	1980
Ambrose E. McCaskey	West Virginia	DSA	1980
John J. McMahon, Sr.	Michigan	DSA	1980
Henry S. Steinbrugge	Oregon	DSA	1980
T. E. Stivers	Georgia	DSA	1980
*William E. Carew, Jr.	Delaware	DSA	1981
*O. B. Curtis, Sr.	Mississippi	PA	1981
Larry D. Nixon	North Carolina	DSA	1981
*Frederick Rogers, Sr.	Maryland	DSA/SC	1981
Alfred H. Samborn	Ohio	DSA	1981
*Herman E. Smith	Oklahoma	DSA	1981
Goodwin G. Thomas	South Carolina	DSA	1981
*Carlton T. Wise	South Carolina	DSA	1981
Alfred W. Lane	Vermont	DSA	1982
Edward T. Misiaszek	New York	DSA	1982
G. Leigh Morrow	Minnesota	DSA	1982
Ferrell J. Prosser	South Carolina	DSA	1982
Rex A. Tynes	Colorado	DSA	1982
Sam H. Wainwright	Alabama	DSA	1982
Eugene N. Bechamps	Florida	DSA	1983
Michael J. Deutch	D.C.	DSA	1983
**Melvin E. Luke	Illinois	DSA	1983
Wilbur H. Mechwart	Ohio	DSA	1983
Forest H. North	Mississippi	DSA	1983
George R. Russell	Idaho	DSA	1983
George J. Cook	Oregon	DSA	1984
Fred C. Culpepper, Jr.	Louisiana	DSA	1984
Victor C. Fender	Kentucky	DSA	1984
R. Duane Monical	Indiana	DSA	1984
Waldemar S. Nelson	Louisiana	DSA/SC	1984
Walter K. O'Loughlin	Maryland	DSA	1984
*J. Harry Parker	Massachusetts	DSA	1984
Marion L. Smith	Ohio	DSA	1984
Roy J. Thompson	Oklahoma	DSA	1984
Paul D. Belz	Maryland	DSA	1985
A. J. Brouillette	Louisiana	DSA	1985
Mark Chilton	Nevada	DSA	1985
John T. Merrifield	Oregon	DSA	1985

*J. Fred Sauls	Oklahoma	DSA	1985
Jack W. Anderson	Tennessee	DSA	1986
Marjorie L. Carpenter	New York	DSA	1986
Charles L. Kimberling	Oklahoma	DSA	1986
Edward A. Lobnitz	Florida	DSA	1986
Paul R. Munger	Missouri	DSA	1986
**Chappell N. Noble	North Carolina	DSA	1986
John W. Pearson	Minnesota	DSA	1986
*B. L. Baker	South Carolina	DSA/SC	1987
Chris Demopulos	Louisiana	DSA	1987
James L. Meyer	Louisiana	DSA	1987
George D. Sellards II	Colorado	DSA	1987
Paul Taylor	Alabama	DSA	1987
Donald D. Vick	Oklahoma	DSA	1987
**Thomas M. Wilson	Georgia	DSA	1987
Jimmie R. Yee	California	DSA	1987
John G. S. Billingsley	Delaware	DSA	1988
Juan A. Bonnet, Jr.	Puerto Rico	DSA	1988
*Edward C. Jordan	Maine	DSA	1988
Albert T. Kersich	Montana	DSA	1988
John E. Lyons	New Hampshire	DSA	1988
Edward J. McNamara	Louisiana	DSA	1988
Lewis N. (Nick) Melton	Kentucky	DSA	1988
James W. Reeves	Louisiana	DSA	1988
Alfred E. Bryne	Washington	DSA	1989
C. Quentin Ford	New Mexico	DSA	1989
Robert W. McClure	Delaware	DSA	1989
Allen H. Seckinger	Florida	DSA	1989
T. E. Stivers	Georgia	DSA/SC	1989
Walter W. Turner	Maine	DSA	1989
Sam H. Wainwright	Alabama	DSA/SC	1989
*Frank E. White	Illinois	DSA	1989
Eugene N. Bechamps	Florida	DSA/SC	1990
C. Quentin Ford	New Mexico	DSA/SC	1990
William J. Hanna	Colorado	DSA/SC	1990
*Edward L. Pine	Nevada	DSA/SC	1990
Daniel F. Hang	Illinois	DSA	1990
Peter M. Jorgensen	Wyoming	DSA	1990
Robert D. Kersten	Florida	DSA	1990
Robert Kirkpatrick, Jr.	New Jersey	DSA	1990
*Francis C. Roy	Louisiana	DSA	1990
Dale W. Sall	Nebraska	DSA	1990
Roy A. Avent, Jr.	Washington	DSA	1991

George A. Brizendine	Nevada	DSA	1991
*Leon H. Clary	New York	DSA	1991
Robert C. Flory	Missouri	DSA	1991
Tai Funatake	Oregon	DSA	1991
Robert K. Hunter	Mississippi	DSA	1991
*J. Harry Parker	Massachusetts	DSA/SC	1991
*Herman Smith	Oklahoma	DSA/SC	1991
Robert B. Boswell	Alaska	DSA	1992
*William A. Kruger	Illinois	DSA	1992
Kenneth A. McCollom	Oklahoma	DSA	1992
Richard A. Parmelee	Illinois	DSA	1992
Thomas F. Talbot	Alabama	DSA	1992
Albert T. Kersich	Montana	DSA/SC	1992
Charles L. Kimberling	Oklahoma	DSA/SC	1992
Joseph J. DeJonghe	Ohio	MSA	1992
Montgomery T. Speir	North Carolina	MSA	1992
John E. Lyons	New Hampshire	DSA/SC	1993
**Francis C. Roy	Louisiana	DSA/SC	1993
Edward H. Fauth	Illinois	DSA	1993
T. Keith King	Alabama	DSA	1993
David G. Krehbiel	Missouri	DSA	1993
John W. Lund	Oregon	DSA	1993
James F. McDonough	Ohio	DSA	1993
*Bryon D. Spangler	Florida	DSA	1993
Sarah E. Hines	Alabama	MSA	1993
Mary M. Law	South Carolina	MSA	1993
*H. Alfred Bolton III	Georgia	DSA	1994
Elaine Fink	Minnesota	DSA	1994
William L. Karr	Michigan	DSA	1994
E. Walter LeFevre	Arkansas	DSA	1994
Richard A. Marr	Iowa	DSA	1994
George K. Nishimura	Hawaii	DSA	1994
Alfred E. Schindler	Connecticut	DSA	1994
Lowell E. Torseth	Minnesota	MSA	1994
Margaret E. Wise	Delaware	MSA	1994
E. David Dorchester	Texas	DSA	1995
Dale J. Henry	Illinois	DSA	1995
Wendell A. Higgins	Idaho	DSA	1995
John Ed Isbell	Arkansas	DSA	1995
James G. Knudsen	Oregon	DSA	1995
William A. Lotz	Maine	DSA	1995
Paul Taylor	Alabama	DSA/SC	1995
Susan Miller	Colorado	MSA	1995

Laverne L. Zink	North Dakota	MSA	1995
Benjamin Harrison	Louisiana	LEA	1995
Haunani S. L. Kekuna	Pennsylvania	DSA	1996
Dennis F. Meyer	North Dakota	DSA	1996
Charles J. Neff	Ohio	DSA	1996
William H. Palm	Florida	DSA	1996
John W. Steadman	Wyoming	DSA	1996
Paul L. Landry	Louisiana	MSA	1996
Robert W. McClure	Delaware	DSA/SC	1996
Jerry T. Carter	North Carolina	LEA	1996
George A. Twiss	Washington	LEA	1996
Jolee L. Belzung	Iowa	DSA	1997
J. Carroll Hastings	Alabama	DSA	1997
Albert W. Hayes	Illinois	DSA	1997
Lewis H. Poe II	New Mexico	DSA	1997
*Leon H. Clary	New York	DSA/SC	1997
Peter M. Jorgensen	Wyoming	DSA/SC	1997
Ann Hicks	West Virginia	MSA	1997
Patricia Peters	Iowa	MSA	1997
Ronald W. Dalrymple	Arizona	LEA	1997
Thaddeus E. Watkins	Tennessee	LEA	1997
George Brizendine	Nevada	DSA/SC	1998
Warren L. Fisk	South Dakota	DSA	1998
David F. Gibson	Montana	DSA	1998
Frank L. Gaddy	West Virginia	DSA	1998
Andrew L. Sikes	Texas	DSA	1998
Sam L. Sullivan	Louisiana	DSA	1998
Agnes R. Smith	Rhode Island	MSA	1998
Thelma Barrington	Illinois	MSA	1998
Billy Cline	Arkansas	MSA	1998
Daniel F. Hang	Illinois	DSA/SC	1999
R. Larry Greene	North Carolina	DSA	1999
Edwin M. Hardin	Alabama	DSA	1999
Sven O. Johnson	Illinois	DSA	1999
L. G. "Skip" Lewis, Jr.	South Carolina	DSA	1999
William T. Sperry, Jr.	Delaware	DSA	1999
Kenneth R. White	New Mexico	DSA	1999
Ann Whipple	South Dakota	MSA	1999
Carol Jean Smith	Alabama	LEA	1999
John W. Lund	Oregon	DSA/SC	2000
W. Gene Corley	Illinois	DSA	2000
Harry L. Goff	Colorado	DSA	2000
Ralph W. Goodson	Wyoming	DSA	2000

Rita M. Lumos	Nevada	DSA	2000
Bruce A. Pitts	Oklahoma	DSA	2000
Dana Rucker	North Carolina	DSA	2000
Eugene B. Snell	Delaware	DSA	2000
Bill I. Dickerson	Oklahoma	MSA	2000
Christine Turk	Wyoming	MSA	2000
Charles Langbein	Florida	DSA	2001
Frank Loudon	Nevada	DSA	2001
Steve Schenk	Oregon	DSA	2001
Joe Sisler	Kentucky	DSA	2001
Dave Curtis	Idaho	MSA	2001
Larry Perkins	Kentucky	MSA	2001
Dale W. Sall	Nebraska	DSA/SC	2002
**William A. Kruger	Illinois	DSA/SC	2002
Michael W. Drissel	Colorado	DSA	2002
Stanley C. Harris	Maryland	DSA	2002
M. John Karshenas	Illinois	DSA	2002
Andrew B. Liston	Massachusetts	DSA	2002
Fredrick J. Rittershaus	South Dakota	DSA	2002
Robert J. Rohde	Nebraska	DSA	2002
Lorraine O'Keefe	New York	MSA	2002
Christy Allen	Tennessee	MSA/LE	2002
John W. Steadman	Alabama	DSA/SC	2003
J. Richard Cottingham	North Carolina	DSA	2003
Roy W. Entz	Oklahoma	DSA	2003
Dale A. Jans	South Dakota	DSA	2003
John R. Madden	Minnesota	DSA	2003
Murray L. Rhodes	Kansas	DSA	2003
Cindi Christenson	California	MSA	2003
Angeline C. Kinnaird	Colorado	MSA	2003
Betty L. Rose	Kansas	MSA	2003
**Leo W. Ruth, Jr.	California	PA	2003

DSA/SC	*Distinguished Service Award with Special Commendation*
DSA	*Distinguished Service Award*
MSA	*Meritorious Service Award*
LEA	*Meritorious Service Award for Law Enforcement*
PA	*President's Award*
*	*Known Deceased*
**	*Awarded Posthumously*

Appendix 9
Examination Usage

Number of Examinations Administered

Year	FE	PE	FLS	PLS
1976	27,100	16,300	2,100	1,100
1977	26,900	16,600	2,100	1,200
1978	29,400	14,900	2,400	1,300
1979	34,558	16,137	2,713	1,455
1980	37,500	16,200	2,500	1,600
1981	41,200	16,400	2,900	1,700
1982	42,054	15,762	2,804	1,801
1983	43,049	17,591	2,845	1,647
1984	41,883	19,063	2,832	1,693
1985	43,782	19,771	3,128	1,656
1986	43,861	22,113	3,031	1,700
1987	42,995	24,071	3,241	2,612
1988	43,264	24,722	3,789	1,964
1989	45,098	25,171	3,880	2,002
1990	46,428	27,321	3,686	2,184
1991	49,094	27,847	3,577	2,005
1992	51,811	29,521	3,366	2,172
1993	54,300	29,809	3,034	1,781
1994	50,236	29,748	2,770	1,761
1995	48,834	29,893	2,587	1,556
1996	45,726	31,045	2,653	1,645
1997	41,964	27,183	2,643	1,544
1998	38,800	26,567	2,611	1,658
1999	38,403	26,752	3,018	1,945
2000	37,236	27,415	3,283	1,989
2001	37,845	27,420	2,817	1,772
2002	41,375	28,879	2,917	1,685
2003	41,967	28,013	2,736	2,120

Exams Offered by Member Boards

NCEES Offered:		May-65	Dec-66	Oct-85	Oct-85	Apr-73	Oct-92
Board	Board Code	FE	PE	STR 1	STR2	FLS	PLS (6 HR)
Alabama	21	May-65	Dec-70	Apr-96		Nov-74	Oct-92
Alaska	60	Apr-66	Apr-67			Apr-74	Oct-92
Arizona	22	May-65	Nov-73	Oct-90	Oct-90	Apr-73	Oct-92
Arkansas	46	May-65	Apr-67	Oct-86	Oct-93	Apr-78	Oct-92
California	57	Apr-71	Nov-74			Nov-73	Apr-03
Colorado	68	Oct-81	Oct-81	Oct-91		Apr-81	Oct-92
Connecticut	69	Apr-74	Apr-74	Oct-86	Oct-86	Nov-75	Oct-92
Delaware	23	May-65	Dec-66	Apr-94	Apr-00	Apr-73	Oct-92
D.C.	24	May-65	Dec-66	Oct-97			Oct-00
Florida	51	Dec-65	Apr-70	Oct-85	Oct-85	Apr-75	Oct-92
Georgia	25	May-65	Dec-66	Apr-89		Nov-73	Oct-92
Guam	47	May-65	Dec-66	Oct-87	Oct-87	Apr-73	Oct-92
Hawaii	26	May-65	Apr-67	Oct-94	Oct-94	Apr-86	Oct-92
Idaho	61	Dec-68	Dec-68	Oct-99	Apr-00	Nov-73	Oct-92
Illinois	70	Apr-84	Apr-84	Oct-85	Oct-87	Apr-84	Oct-92
Indiana	65	Dec-67	Apr-73	Oct-96	Apr-01	Nov-73	Oct-92
Iowa	52	Dec-65	Dec-66	Oct-85		Apr-73	Oct-92
Kansas	53	Dec-65	Apr-74	Oct-94		Nov-75	Oct-92
Kentucky	71	Dec-70	Dec-70	Oct-85	Oct-95	Apr-73	Oct-92
Louisiana	54	Dec-65	Dec-68	Oct-94	Oct-02	Apr-74	Oct-92
Maine	27	Dec-65	Dec-66	Apr-91	Apr-96	Apr-75	Oct-92
Maryland	45	Dec-67	Apr-67	Apr-98		Nov-75	Oct-92
Massachusetts	28	Apr-70	Dec-71	Oct-95		Apr-73	Oct-92
Michigan	72	Apr-71	Nov-76	*Oct-00		Nov-73	Oct-92
Minnesota	58	Apr-66	Apr-67	Oct-87	Oct-87	Apr-73	Oct-92
Mississippi	29	May-65	Dec-66	Oct-96		Apr-74	Oct-92
Missouri	30	May-65	Dec-70	Oct-00		Nov-75	Oct-92
Montana	31	May-65	Dec-66	Oct-00		Apr-73	Oct-92
Nebraska	63	Apr-67	Dec-68	Oct-85	Oct-86	Oct-90	Oct-92
Nevada	32	May-65	Apr-67	Apr-93	Apr-93	Nov-73	Oct-92
New Hampshire	33	Apr-68	Apr-68	Apr-96		Nov-79	Oct-92
New Jersey	73	Oct-80	Oct-83	Oct-92		Oct-83	Oct-92
New Mexico	49	May-65	Dec-66	Oct-99	Apr-00	Apr-73	Oct-92
New York	67	Apr-70	Apr-70	Apr-97	Oct-97	Apr-75	Oct-92
North Carolina	59	Dec-70	Dec-70	Oct-94	Apr-96	Nov-73	Oct-92
North Dakota	42	May-65	Apr-67	Oct-96		Apr-73	Oct-92
N. Mariana Islands	76	Apr-92	Oct-92	Apr-94			Oct-92
Ohio	64	Apr-67	Apr-67		Oct-99	Nov-73	Oct-92

NCEES Offered:		May-65	Dec-66	Oct-85	Oct-85	Apr-73	Oct-92
Board	Board Code	FE	PE	STR 1	STR2	FLS	PLS (6 HR)
Oklahoma	55	Dec-65	Dec-68	Oct-93	Apr-96	Nov-73	Oct-92
Oregon	34	May-65	Apr-67	Oct-85	Oct-85	Apr-74	Oct-92
Pennsylvania	35	Apr-79	Apr-79	Oct-95		Apr-79	Oct-92
Puerto Rico	62	Dec-66	Dec-66	Apr-95	Apr-03	Apr-82	Oct-92
Rhode Island	50	May-65	Dec-66	Oct-93		Apr-73	Oct-92
South Carolina	36	May-65	Dec-66	Apr-92	Oct-00	Apr-74	Oct-92
South Dakota	37	May-65	Dec-66	Oct-87	Oct-87	Nov-73	Oct-92
Tennessee	38	May-65	Apr-67	Oct-93	Apr-96	Nov-81	Oct-95
Texas	39	May-65	Dec-66	Apr-89	Oct-90	Apr-88	
Utah	40	Dec-68	Apr-69	Apr-94	Oct-94	Apr-74	Oct-92
Vermont	43	Apr-67	Dec-67	Oct-88	Oct-99	Nov-75	Oct-92
Virginia	41	Dec-65	Dec-66	Apr-96	Apr-97	Nov-77	Oct-92
Virgin Islands	75	Dec-70	Dec-70	Apr-97		Nov-73	Oct-92
Washington	56	Dec-65	Apr-67	*Oct-98	Oct-98	Apr-84	Oct-00
West Virginia	44	May-65	Apr-68	Oct-93		Apr-80	Oct-92
Wisconsin	66	Dec-68	Apr-71	Apr-95		Apr-73	Oct-92
Wyoming	74	Dec-70	Apr-71	Apr-90	Apr-02	Nov-84	Oct-92

Note: STR2 in 1985 and 1986 consisted of eight 1-hour structural problems.
Commencing with October 1987 the format changed to a 4-hour design problem in AM and PM.
** = no longer offer this exam*

Appendix 10
Participating Organizations Liaison Council

AAEE . . . . . American Academy of Environmental Engineers
ACEC . . . . . American Council of Engineering Companies
ACSM . . . . . American Congress on Surveying and Mapping
AEI . . . . . Architectural Engineering Institute of ASCE
AIChE . . . . . American Institute of Chemical Engineers
ANS . . . . . American Nuclear Society
ASAE . . . . . American Society of Agricultural Engineers
ASCE . . . . . American Society of Civil Engineers
ASEE . . . . . American Society for Engineering Education
ASHRAE . . . . . American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME . . . . . American Society of Mechanical Engineers
ASPRS . . . . . American Society for Photogrammetry and Remote Sensing
CASE . . . . . Council of American Structural Engineers of ACEC
CELSOC . . . . . Consulting Engineers and Land Surveyors of California
CESB . . . . . Council of Engineering and Scientific Specialty Boards
CLSA . . . . . California Land Surveyors Association
IEEE . . . . . Institute of Electrical and Electronics Engineers–USA
IIE . . . . . Institute of Industrial Engineers
ISA . . . . . The Instrumentation Systems and Automation Society
MSPS . . . . . Michigan Society of Professional Surveyors
NCSEA . . . . . National Council of Structural Engineering Associations
NICE . . . . . National Institute of Ceramic Engineers
NSPE . . . . . National Society of Professional Engineers
NSPS . . . . . National Society of Professional Surveyors
SFPE . . . . . Society of Fire Protection Engineers
SEI . . . . . Structural Engineering Institute of the ASCE
TMS . . . . . The Minerals, Metals & Materials Society

**As of May 2004*

Appendix 11
NCEES Annual Meetings

1920	Chicago, IL	November 8–9
1921	St. Louis, MO	November 8–9
1922	Chicago, IL	October 2–3
1923	Chicago, IL	October 1–2
1924	Washington, DC	November 10–11
1925	Indianapolis, IN	November 16–17
1926	Philadelphia, PA	November 15–16
1927	Asheville, NC	November 21–22
1928	Little Rock, AR	November 19–20
1929	Yellowstone Park, WY	August 26–28
1930	Richmond, VA	October 20–21
1931	Detroit, MI	October 1–3
1932	New York, NY	September 29–October 1
1933	Chicago, IL	June 26–28
1934	Portland, OR	October 4–6
1935	Columbus, OH	October 23–24
1936	Knoxville, TN	October 19–21
1937	Scranton, PA	October 11–13
1938	Des Moines, IA	October 17–19
1939	San Francisco, CA	July 26–29
1940	Charleston, SC	October 28–31
1941	New York, NY	October 27–30
1942	(No Meeting)	
1943	Indianapolis, IN	October 25–26
1944	Lexington, KY	October 30–31
1945	(No Meeting)	
1946	St. Louis, MO	October 27–29
1947	New York, NY	October 27–29
1948	Salt Lake City, UT	October 26–28
1949	Daytona Beach, FL	November 10–12
1950	Chicago, IL	October 9–11
1951	Boston, MA	October 21–24
1952	Colorado Springs, CO	September 4–6
1953	San Antonio, TX	October 29–31
1954	St. Paul, MN	August 26–28
1955	Washington, DC	October 20–22
1956	Los Angeles, CA	August 23–25
1957	Atlanta, GA	October 31–November 1
1958	Milwaukee, WI	August 21–23
1959	Roanoke, VA	August 19–22
1960	Portland, OR	August 18–20
1961	Biloxi, MS	August 24–25
1962	Kansas City, MO	August 22–25
1963	Honolulu, HI	August 26–30
1964	Philadelphia, PA	August 18–21
1965	Miami Beach, FL	August 24–27
1966	French Lick, IN	August 16–19
1967	Wilmington, DE	August 15–18
1968	Denver, CO	August 26–30
1969	San Antonio, TX	August 25–29
1970	Chicago, IL	August 16–21
1971	San Juan, PR	August 23–27
1972	Seattle, WA	August 21–25
1973	New Orleans, LA	August 12–15
1974	Mackinac Island, MI	August 18–21
1975	Boston, MA	August 10–14
1976	Tucson, AZ	August 15–18
1977	Atlanta, GA	July 31–August 3
1978	Louisville, KY	August 6–9
1979	Norfolk, VA	August 5–8
1980	Incline Village, NV	August 10–13
1981	Tulsa, OK	August 9–12
1982	Minneapolis, MN	August 8–11
1983	Albany, NY	August 14–17
1984	San Francisco, CA	August 12–15
1985	Hilton Head Island, SC	August 12–15
1986	St. Louis, MO	August 10–13
1987	Baltimore, MD	August 13–15
1988	Albuquerque, NM	August 10–13
1989	Point Clear, AL	August 2–5
1990	Milwaukee, WI	August 1–4
1991	Nashua, NH	August 7–10
1992	Portland, OR	August 12–15
1993	Nashville, TN	August 11–15
1994	Rapid City, SD	August 3–7
1995	Pittsburgh, PA	August 9–12
1996	Coeur d' Alene, ID	August 7–10
1997	New Orleans, LA	August 6–9
1998	Honolulu, HI	August 12–15
1999	Buffalo, NY	August 4–7
2000	Chicago, IL	August 2–5
2001	Little Rock, AR	August 1–4
2002	La Jolla, CA	August 7–10
2003	Baltimore, MD	August 13–16

Appendix 12
Chronology

1907 Wyoming passed first engineering registration law.

1920 The Council of State Boards of Engineering Examiners founded by 7 of the 10 state boards having engineering and land surveying licensing laws at its first Annual Meeting in Chicago.

1921 Ten states belonged to CSBEE; 24 states had registration laws.

1922 Articles of Agreement on Reciprocal Registration of Engineers adopted.

1923 Articles amended to replace word "license" with "registration."

T. Keith Legaré elected first continuing secretary-treasurer. First office located in Columbia, SC.

1925 Proceedings of the Annual Meeting first published.

1928 List of 131 "Engineering Schools of Recognized Standing" first published.

1929 Constitution amended so that past presidents shall be permanent members of Council.

1931 "National" added to name of Council (NCSBEE).

1932 Plan for ECPD approved. *Model Law for Registration of Engineers and Land Surveyors* approved.

National Bureau of Engineering Registration established.

1933 Constitution and Bylaws revised to create Board of Directors, zones, and position of Executive Secretary.

1935 Report of Uniform Examinations Committee recommending content and procedures published.

1938 NCSBEE incorporated as eleemosynary organization in the State of South Carolina.

First Distinguished Service Certificates awarded.

1939 Quarterly publication of *Registration Bulletin* began.

1943 *Model Law* revised to incorporate concept of "Engineer-in-Training."

1947 First Land Surveying Committee reported.

1950 Registration laws of some kind adopted by all states plus Alaska, Hawaii, District of Columbia, and Puerto Rico.

1953 Interim meetings held by all zones for first time.

Syllabus for examinations published with specifications for questions.

1960 T. Keith Legaré retired after 37 years as Executive Secretary. Dean James H. Sams appointed Executive Secretary. Headquarters moved to Clemson, SC.

1965 First NCSBEE Fundamentals of Engineering (FE) examination administered.

1966 First NCSBEE Principles and Practice of Engineering (PE) examination administered.

1967 Name changed to National Council of Engineering Examiners (NCEE).

1970 Executive Secretary James H. Sams died.

1971 Walter J. Edelblut appointed Executive Secretary.

Title changed to Executive Director.

1972 Headquarters moved to Seneca, SC.

1973 First NCEE Fundamentals of Land Surveying (FLS) examination administered.

1974 First NCEE Principles and Practice of Land Surveying (PLS) examination administered.

1975 Morton S. Fine appointed Executive Director.

1979 NCEE Records Program replaced National Engineering Certificate.

1980 Ground broken for new headquarters building in Clemson, SC.

1981 New headquarters occupied and dedicated.

1982 Roger B. Stricklin, Jr., appointed Acting Executive Director.

1983 Roger B. Stricklin, Jr., appointed Executive Director.

1984 With the addition of Illinois, all Member Boards use uniform national examinations.

1985 First NCEE Special Structural I examination administered.

1987 First NCEE Special Structural II examination administered.

1989 Name changed to National Council of Examiners for Engineering and Surveying (NCEES).

Construction began on headquarters expansion.

United States Council for International Engineering Practice (USCIEP) is formed with NSPE and ABET to negotiate trade agreements on engineering services.

1990 New building dedicated.

Ceramic examination offered for the last time.

1992 First Control Systems PE examination administered.

PLS examination changed to 6-hour.

PLS 1 (Public Domain) offered for the last time.

PLS 2 (Colonial) offered for the last time.

PE examinations booklets printed by discipline.

1993 William L. Karr, L.S., became first land surveyor to be installed as NCEES President.

First Environmental examination offered.

FE examination changed to closed book, with supplied-reference.

1994 Combined examination no longer offered.

1995 Executive Director Roger B. Stricklin, Jr. retired.

Frances Elizabeth (Betsy) Browne appointed Executive Director.

1996 Afternoon portion of FE examination changed to six discipline-specific modules (Chemical, Civil, Industrial, Electrical, Mechanical, and General) to test upper-division knowledge.

1999 First FLS academic-based exam given at October administration.

2000 NCEES Engineering and Land Surveying Examination Services (ELSES) established.

2002 Civil, Electrical and Computer, and Mechanical PE exams all administered in the breadth/depth, all-objectively scored format at April administration.

All PE exams (except Structural II) given in the all-objectively scored format at October administration.

A seventh discipline-specific module—Environmental—added to FE examination.

2003 ELSES, LLC chartered as a single-member, limited liability company managed by NCEES.

2004 Building addition dedicated.