



Chapter 1

100 Years of Progress

By Stanley I. Proctor

The American Institute of Chemical Engineers has been serving its members and the public for 100 years. Although it is the youngest and smallest of the five “Founder Societies” of Engineering in the U. S., it is unique in its impact and contributions to society. In 1904 the United Engineering Society (now the United Engineering Foundation) was created with the American Institute of Mining, Metallurgical and Petroleum Engineers (AIME, founded 1871), The American Society of Civil Engineers (ASCE, founded 1852), the American Society of Mechanical Engineers (ASME, founded 1880), and the Institution of Electrical and Electronic Engineers (IEEE, founded as AIEE in 1884) as its members. Even though AICHE joined the Founder Societies in 1958, it is considered a member since 1908 retroactively.

Since much of the early history of the Institute has been documented in the following anniversary publication, we will focus here on the last 25 years with a brief overview of its entire history.

1. *Silver Anniversary of Chemical Engineering in America*¹
2. *High Lights: The First Fifty Years of the American Institute of Chemical Engineers*²
3. *75 Years of Progress—a History of the American Institute of Chemical Engineers 1908-1983*³

All of these were published by AIChE and are available on its web site at <http://www.aiche.org/About/Centennial/Books/index.aspx>. Since other chapters in this book will discuss major activities and achievements of the Institute in detail, the focus in this chapter will be on important initiatives and accomplishments of the past quarter century, as well as recent accomplishments of the Institute as determined by its Executive Directors.

Early Years of Chemical Engineering

Duvall and Johnston, in their book, *Scaling Up*⁴, indicated that the first mention of the term, chemical engineer, occurred in 1839. In this book, they quoted Andrew Ure, a chemist, discussing, in his *Dictionary of Art Manufactures and Mines*, the steam nozzle in the lead chamber, “It deserves to be noted that the incessant tremors produced in this pipe by the escape of steam cause the orifice to contract.... Provision should therefore be made against this event, by the chemical engineer.” Ure was probably referring to a mechanical engineer working in the chemical industry. Indeed, the earliest mention of chemical engineers was the connection between mechanical engineers and industrial chemists involved with the chemical industry.

However, terms chemical engineering and chemical engineer did not really begin to emerge until the 1870’s, primarily in Great Britain and Germany. The Society of the Chemical Industry (SCI) was formed in 1881. George Davis, its first General Secretary, is considered by many as the founder of chemical engineering. He and his colleagues proposed

a Society of Chemical Engineers, but they were not successful, because most did not call themselves chemical engineers or know what a chemical engineer should be⁵. In 1882, 15 of the approximately 300 SCI members claimed to be chemical engineers. In 1900, there were only 42 out of the total British membership of 2300⁴.

The development of chemical engineering in the U.S. followed soon afterward. The first chemical engineering program, called “Course X,” was introduced at MIT in 1888 and was taught by a chemistry professor, Lewis M. Norton. The first Chemical Engineering Department (so named) started at the University of Pennsylvania in 1893 by Edgar Fahs Smith, professor of chemistry and University Provost. Other universities followed, such as Columbia University, the University of Michigan, and the University of Wisconsin.

Founding of the Institute

It took a while for an organization of chemical engineers to be established. It is interesting that the founders were not graduates of the newly established chemical engineering programs, but rather were industrial chemists and mechanical engineers who had developed their chemical engineering skills through industrial practice.

In October 1905, Richard K. Meade, a founder and editor of *Chemical Engineering* magazine, in an editorial, proposed the formation of an American Society of Chemical Engineering. It took a while for the idea to take hold. In March 1907, he republished his editorial and sent letters to 50+ “chemical engineers” whom he knew. An organizing meeting was held in June 21, 1907 during a meeting of the American Society for Testing Materials (ASTM). The group of 12 met with Dr. Charles F. McKenna as Chair and committee of six was established to look further into the formation of a society. The members were McKenna, Meade, J. C. Olsen, William H. Walker, Arthur D. Little and William M. Booth.

The work of the committee is documented in the earlier histories of the AIChE. At an organizational meeting held on June 22, 1908, the Institute

was formed and forty charter members were identified. The officers of the new society were:

President – Samuel P. Sadtler

First Vice President – Charles F. McKenna

Second Vice President – H. August Hunicke

Third Vice President – Edward G. Acheson

Secretary – John C. Olsen

Treasurer – Wm. M. Booth

Auditor – Richard K. Meade

The first Annual meeting of AIChE was held in Pittsburgh on December 28-29, 1908.

The founding was not without controversy. The American Chemical Society (ACS) was founded in 1876 and by 1908 had several thousand members. It claimed to represent all those involved in pure and applied chemistry and did not take kindly to a rival organization. Within days after the formation of AIChE, the ACS formed its first division, the Division of Industrial Chemistry and Chemical Engineering, and shortly thereafter launched a new publication, the *Journal of Industrial and Engineering Chemistry*. The founders of AIChE, most of whom were also members of ACS, claimed that the new society was not meant to be a replacement to the ACS but a complement, which still is the case today.

Governance

The governing body of AIChE consists of a group of officers and 12 directors, all elected by the membership in contested elections. The directors serve for three-year terms and four are elected each year. These officers and directors comprise the Board of Directors (called the Council until 1999). The officers are President, President-Elect (previously Vice President), most recent living Past President, Secretary and Treasurer. The Secretary and Treasurer are elected for three-year terms. The President-Elect automatically succeeds President and then becomes Past President. These officers comprise the Executive Committee with the Executive

Director of the Institute serving in an *ex-officio* capacity. The officers all shall have previously served as a director.

In 1999, the (then) Council determined that, because of the growth of the Institute, the members of that body could not have direct oversight of all of the various member functions and activities. They, therefore, created the concept of Operating Councils to perform such oversight. The Council, which was renamed the Board of Directors, could then focus on more strategic issues.

Three Operating Councils were created with the following responsibilities, which were approved by the Board of Directors.

Career & Education is focused on the “lifetime center” concept of membership. Accountabilities include professional development, career and financial services, and AIChE’s role in chemical engineering degreed education.

Chemical Engineering Technology is responsible for two major areas; first, the frontiers of chemical engineering, in other words, knowledge advancement; second, the dissemination of that knowledge. Accountabilities include meetings, publications, and some of AIChE’s technical societies.

Societal Impact leads efforts to define how chemical engineers can most effectively address societal needs. Accountabilities include outreach and public policy, diversity of the profession, and the global business environment.

Almost all of the member entities (committees, divisions, forums, local sections, etc.) report to one of these Councils.

It was mentioned earlier that the change in the governance structure would allow the Board of directors to be less occupied by day-to-day activities and be able to spend more time on strategic planning.

Long-range or strategic planning has been and continues to be an important aspect of the governance of the Institute. In 1980, the Council established a Long-Range Planning Committee. In 1983, the committee, chaired by Past President W. R. Marshall, submitted its report to the membership identifying eight long-range issues along with recommendations to address them. They were:

- I. What is chemical engineering and what is a chemical engineer?
- II. What will be the make-up of the chemical engineering profession and AIChE ten years or more down the road?
- III. What will be the impact of new technologies on chemical engineering and AIChE?
- IV. Should the structure of AIChE be changed?
- V. How will AIChE be affected by new developments in communications?
- VI. What should AIChE advocate for the future of engineering education?
- VII. What should be the patterns of government interaction for AIChE as time goes by?
- VIII. How can AIChE best deal with societal problems on a continuing basis?

A more comprehensive strategic planning process was begun under Executive Director Emmert and completed under Executive Director Glenn Taylor. It was put forth as “Destination...21st Century: AIChE’s Strategic Plan.” It presented the following Vision for the Institute: “Under the new strategic plan, AIChE provides value as the global leader of the chemical engineering profession; the lifetime center for professional and personal growth and security of chemical engineers; and, the foremost catalyst in applying chemical engineering expertise to meet societal needs.”

The planning process has continued and the most recent, the Genesis Strategic Plan, was completed under Executive Director John Sofranko.

The Executive Director, hired by the Board of Directors who oversees the office, heads the paid staff of AIChE and has the responsibility for the day-to-day operations of the Institute. He/she also serves as the primary face of the AIChE to the public and to the membership. Until 1987, the Executive Director was also the Secretary and stood for election (uncontested) for that position. The original title for the position was Executive Secretary.

The first full-time paid Executive Secretary was Stephen L. Tyler who assumed that position in April, 1937. The Executive Directors (Secretaries) of AIChE were:

Stephen L. Tyler	1937-1954
F. J. Van Antwerpen	1955-1978
J. Charles Foreman	1978-1987
James F. Mathis	1987-1988
Richard E. Emmert	1988-1996
Glenn E. Taylor	1996-2001
John A. Sofranko	2001-

Due to J. C. Forman's abrupt departure from AIChE in August, 1987, J.F. Mathis was appointed by the Executive Committee to serve as interim Executive Director in November, 1987. In the interval, the position was vacant and the then President of the Institute, Stanley I. Proctor, served in that role in an unofficial capacity. Also, in August, 1987, the Council voted to separate the Secretary position from that of Executive Director.

Education

Education has always been a key element of the Institute's activities. As mentioned earlier, chemical engineering as an educational program in the U.S. began before 1900. A standing committee on chemical engineering education was established at the Institute's founding in 1908. In 1922, the committee was reconstituted to evaluate if chemical engineering programs met recommended criteria. This was the beginning of accreditation and predated the formation of the Engineers' Council for Professional Development (ECPD) in 1932, which, as part of its

responsibilities, took on the role of accreditation of engineering programs in the U.S. AIChE was a founding member. The reconstituted committee has been active ever since and is now known as the Education and Accreditation (E&A) Committee.

The accreditation activities were taken over by a new organization, the Accreditation Board for Engineering and Technology (ABET) when ECPD was dissolved in 1980. AIChE has always been a leader in the accreditation process, both internally and within ABET.

AIChE has been a leader in other aspects of chemical engineering education. Chemical engineering educators have served and continue to serve as key leaders. They form the underpinning of the Institute's technical programs and publications. Many divisions and forums have significant educational component.

In 1984, the Council established an Education Advisory Board to “(a) determine the long-term trends affecting the practice of chemical engineers; (b) define the implication of these trends on the educational process for chemical engineers; (c) work cooperatively with other AIChE committees and divisions to develop a set of recommendations to Council for changes that AIChE may wish to urge universities and secondary schools to consider; and (d) work cooperatively with appropriate organizations to help implement council approved programs in this area.” The Board was eliminated when it was determined that its functions were being adequately handled by other organizations within the Institute, notably the E&A Committee and the Career & Education Operating Council.

Diversity

There is no doubt that the founders of AIChE came from the white male community. This is not a surprise because that was the make up of the chemical engineering profession at the time. Over time, however, women and minorities have gradually become significant members of this community. The Institute, in retrospect, was probably slow in recognizing the change, but it did begin to address the issue. In 1967, Gerry Lessells,

along with Henry Brown, established a subcommittee of the Career Guidance Committee called the Subcommittee for the Disadvantaged (i.e., women and minorities) to encourage enrollment of these groups in chemical engineering programs and enhance their participation in AIChE activities. Early efforts were not encouraging, but over the years, especially in the past two decades, progress has been made. This effort is now under the auspices of the Minority Affairs Committee, established in 1989, and the Women's Initiatives Committee, established in 1997. Membership of women and minorities in AIChE is, of course, dependent on their representation in the number of graduates of chemical engineering programs. That is one of the issues addressed by these two committees.

The chemical engineering profession has been positive in terms of attracting women, but much more needs to be done in terms of participation by African-American minorities. AIChE has been rather slow in involving women and minorities in leadership roles. Of note, Margaret Skillern was the first woman elected a Director (1977). Since then, 17 women (out of over 120) have been elected. Dianne Dorland was the first (and only so far) woman elected President (2003). Henry Brown was the first African-American elected director (1981). No African-American has yet served as President.

International Activities

AIChE has always recognized the need for global participation. However, it was felt that, rather than spread itself across the world, it would be better to cooperate with chemical engineering organizations in other countries through alliances and other relationships for the mutual benefit of the profession. Of course, membership in AIChE is open to qualified international members, and there have been clubs and even one local section (Netherlands/Belgium, established in 1970) formed overseas. Their primary purpose has been to serve U. S. nationals living and working in other countries.

An early effort at international cooperation was with the Institution of Chemical Engineers in London (IChemE). In 1925, 60 members of AIChE

sailed from Montreal to meet with their British counterparts. Following that, representatives of the two groups met in Canada in 1928¹.

Interactions also existed with other groups as well. Examples include the Instituto Mexicanos de Ingenieros Quimicos (IMIQ), which AIChE helped found; The Union Panamerica de Asociaciones de Ingenieros (UPADI); the Conference of Engineering Societies of Western Europe and the United States (EUSEC); and the Inter-American Confederation of Chemical Engineering (IACChE)³. Another such group was the Asian Pacific Confederation of Chemical Engineering (APCChE).

In 1962, the Council created the International Relations Committee. It was successful in several areas of increased international participation. Recognizing that this effort was too much for a group of volunteers, the committee was dissolved in 1973³. In 1980, it was reconstituted as the International Activities Committee with the charter to “coordinate AIChE international activities, which include joint meetings, cooperative agreements, and other activities with foreign chemical engineering or other engineering societies or federations. It shall work closely with the Executive Director and the National Program Committee in these activities.” It also had mixed results, and the role of international activities was assumed by the Board of Directors.

In recent years, there has been increased emphasis on international relations. In 1998, the North American Alliance of Chemical Engineers (NAACChE) was formed with sister societies in Canada and Mexico. The World Chemical Engineering Council (WCEC) was formally started at the World Congress of Chemical Engineering in 2001.

In 2002, Past President Bill Doumas had been named as AIChE’s International Ambassador. He served until 2007. The idea was again to get more volunteer input into international activities. He was active with such organizations as IACChE, WCEC, IMIQ, and NAACChE. He was not replaced, but, in 2006, the volunteer effort was reconstituted under an International Team, initially chaired by Deborah Grubbe.

Recent Accomplishments

Since the focus of this book is on the recent history of AIChE, the three most recent Executive Directors were asked to identify the most significant accomplishments that occurred during their tenure. This covers the last 20 years. They are listed below as they were submitted. Many of the topics are mentioned in this chapter and/or discussed in subsequent chapters.

Dick Emmert (1988-1996)

- Launched AIChE Website as a tool for publishing and accessing technical information, conducting membership functions, and networking.
- Materially strengthened AIChE's Washington Office, our Government Relations Committee, and our collaborative efforts with other societies to inform and educate government officials about technical considerations important to legislation and regulation.
- Substantially expanded Center for Chemical Process Safety (CCPS).
- Formed two new divisions: Catalysis and Reaction Engineering Division and Separations Division.
- Created forums: The North American Mixing Forum and The Particle Technology Forum.
- Enhanced chemical engineering curricula by introducing Safety in Chemical Engineering Education (SACHE) as a means of introducing process safety and creating course modules for other areas (such as biotechnology).
- Established a broad-based planning process for the Institute leading to a strategic framework on which today's strategies have emerged.
- Formed Center for Waste Reduction Technology (CWRT).
- Established AIChE Foundation and kicked off corporate campaign with two major gifts from DuPont and Dow.

- Undertook many collaborative activities with other professional societies (ACS and ASME), with associations of societies (AAES and Founder Societies) and with international organizations.
- Through ABET improved efforts on accreditation of undergraduate programs.
- Stimulated discussion on curriculum reform, which still remains unimplemented, but is under more intensive review.
- Contributed to the Chemical Heritage Foundation—an important vehicle to preserve and promote the progress of the chemical sciences.

Glenn Taylor (1996-2001)

- Implemented New Strategic Plan. AIChE staff almost completed an extensive strategic planning exercise when I accepted the position of Executive Director. I worked with the team to complete the process and prioritize the goals. The plan was approved at the 1996 Annual meeting. As one of the first steps to address the organizational structure, an Organizational Structure Task Force was appointed, led by Council member, William Gustafson. Members included Mary Markette, Ron Rosseau, Otis Shelton, Connie Carrol, Dick Traeger, Barbara Hayes, Henry Brown, and Glenn Taylor.
- Facilitated the formation of three Operating Councils, which represents the first structural change of the Institute in 40-50 years. Recognizing that all entities of AIChE reported to the Council (currently called Board of Directors) and that the Council could not effectively supervise or coordinate the activities of the many entities, the Task Force recommended the formation of three Operating Councils with most of the groups reporting to one of them. The former Council became the Board of Directors, with their primary focus being longer-range strategic issues and supervision of the three Councils.
- Launched global leadership efforts. The new strategic plan also focused on the global nature of our profession. Discussions with sister societies, Mexico and Canada, led to the formation of the North American Alliance of Chemical Engineers in 1998 and the

formation of the World Chemical Engineering Council, which was formally started at the World Congress in Melbourne in 2001.

- Successfully conducted the 21st Century Capital Campaign with major leadership gifts by Dupont and Dow. Other gifts by corporations and members helped launch AIChE's major presence on the Internet, as well as other projects.
- Solidified CHF Governance. During 1998-99, the position of ACS and AIChE as the founding members and owners of the Chemical Heritage Foundation was clarified, and board membership for the two organizations was established on a permanent basis.
- Established Women's Initiative Committee. This group was chartered in 1997 in recognition of the increasing number of women in the profession and AIChE to provide more programs and services that uniquely address the needs of female chemical engineers. The group is still active today and plays a key role in serving female chemical engineers.

John Sofranko (2001-)

- Completed the Genesis Strategic Plan. Recognizing the need for AIChE to get involved in and coordinate emerging technologies and multidisciplinary activities, the Institute for Biological Engineering, Institute for Sustainability, and Nanoscale Science and Engineering Forum. Programming in these areas at the national meetings has been expanded dramatically since this program was launched.
- Changed AIChE Constitution to help promote the Genesis concept of making chemical engineering a broader, more inclusive discipline. The affiliate and associate membership grades were combined into the Member grade, and the Senior member grade was created.
- Formed a closer alliance with ACS as a result of discussions on a possible merger of the two societies.
- Formed the International Ambassadorship, initially served by Bill Dumas, to get more volunteer leader involvement in AIChE's international activities.

- Succeeded in implementing the Essentials Plan that was started as a cost-restructuring measure and a strategy to get more operational involvement by volunteer groups. The number of staff was decreased from about 110 in 2000 to 40 in 2003. Real estate footprint was reduced by 75%. Educational Services are offered in partnership with ASME.
- Formed a publishing partnership with John Wiley and Sons for AIChE's four journals and books. This netted AIChE better financial returns, while AIChE retains the copyright ownership. This arrangement also made it possible to digitize all the volumes of all the journals and avoid AIChE's investment to do this.
- Enhanced the cooperation among CHF, ACS, and AIChE. The Founders Committee was formed to help facilitate strategic alignment among the organizations and open discussions among CHF board members appointed by the two members of the corporation.
- Promoted the joint membership of ASME and AIChE allowing members of one organization to obtain membership in the other at a discounted rate.
- Set up Special Board Task teams to improve AIChE's activities in the energy area, international activities, and the relevancy of AIChE to its members.
- Formed the Student Energy Prize and initiated the Energy Fellowships for graduate students, which is still in the kickoff stage at this writing.

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