JOURNAL OF THE
BOSTON SOCIETY OF CIVIL ENGINEERS SECTION
AMERICAN SOCIETY OF CIVIL ENGINEERS

Volume 64 | April 1977 | Number 1

ENGINEERING — TODAY'S CHALLENGE

Presidential Address of Bertram Berger, PE

(Presented before the Annual Meeting of the Boston Society of Civil Engineers Section, ASCE, April 13, 1977)

Introduction

One year ago today, upon accepting the Presidency, I spoke of many programs which I proposed to initiate during my tenure in office. I should like first to review some of the accomplishments of the last year.

I suggested that three task forces be established for the following purposes:

(1) to reevaluate the Associate Member Forum, making specific recommendations and describing the means of implementing them.

(2) to prepare an Operations Manual for the conduct of the Society's committees, technical groups, and officers.

(3) to establish the basic structure and format for the 1979 ASCE National Convention program to be held in Boston in April 1979.

I am pleased to report that each of the task forces accomplished its goals and objectives. A task force on younger members, under direction of Mr. Anthony DiSarcina, presented findings to the Board of Government and they have since been accepted and implemented.

The Operations Manual task force, chaired by Mr. Edward B. Kinner, has completed the Operations Manual and it is in the process of final editing. The work by the chairman and his committee is a major accomplishment, for we expect this manual will eventually become the standard for many other Sections to follow.

The task force for the 1979 National ASCE Convention was chaired by Mr. Brian Hogan. It completed its charge, and recommended a steering committee and convention organization structure which has since been established. The convention committee had its first meeting with more than forty active participants, which bodes well for success.

I should also like to mention significant changes made in the operations of the Section and of certain standing committees. We can expect major contributions through these changes for the betterment of the Society.

Mr. Saul Namyet, Treasurer and Investment Committee Chairman, reorganized the Section's financial procedures, so that we now have a very professional and organized accounting system.

Mr. Philip J. Caruso, Membership Committee Chairman, has prepared a comprehensive program which is about to be implemented and should have a dramatic impact on the enrollment of new members. It involves an intensified recruiting program from Student Chapters through firms and agencies.

Mr. John P. Hurney, Advertising Committee Chairman, has initiated a new program to procure advertisements for the *Forum* and *Journal.* In the near future we should see results.

Mr. David E. Thompson, Action Program-Professional Practice Committee Chairman, has been very effective in keeping the Board of Government informed and responsive to federal, state and local ordinances, regulations and laws affecting professional engineers.

The technical group officers this year conducted an extensive program with more than forty regular technical group meetings. Of special significance were the joint meetings held with other groups and with student organizations.

This year, special recognition goes to the Transportation Group, chaired by Messrs. Marvin Miller and Maurice Freedman, for introducing many innovative programs and joint meetings, and to the Student Chapter Committee chaired by Mr. Paul Trudeau for a successful student night and a program on employment conditions.

Aside from the regular technical group meeting, there were many other notable activities, such as the geotechnical lecture series and the hydraulic series sponsored by the John R. Freeman Fund.

This has been an active year; the Section provided the members, young and old, with meetings on a wide range of technical and professional matters. As we close the third year following the merger, the Section continues to grow in member support and participation, and its internal operation has become stronger and more responsive to member needs.

The Challenge

My talk this year concerns my dismay and disillusionment with the lack of advancement of the professional engineer's place in society, as viewed by the public. This talk is a broad-brush view to express some very basic concerns about the roots and structure of the engineering profession. My topics do have a common binding thread and thus are interrelated. I hope many will see my position; others may question or challenge my thesis.

> "In a free society the State does not administer the affairs of men . . . It administers justice among men who conduct their own affairs."
>
> Walter Lippman.

Philosophy

The engineer has, through the years, been responsible for phenomenal advances in generation of power, mass production, transportation, communications, and public-works. This has been realized by heavy concen-

tration in the fields of applied sciences and engineering.

His training has taught the engineer to be creative, with due regard for usefulness and costs, and has made available for mankind more material and efficient products. But at the same time he has demanded very little from society in return for his efforts.

The profession has been inarticulate because engineering is so fragmented. The field has become so specialized and organization-oriented that we find some of our colleagues almost alien from one another when they discuss their problems, each in his peculiar jargon, some of which is probably totally incomprehensible to the public.

The engineers do have a measure of respect from the public, for they have shown society their ability to span a river, design public-works projects, design sophisticated machinery and handle problems relating to technology with little question in the mind of the public. Their qualifications and aptitudes are taken for granted, but beyond this their place in society subject of concern by themselves and by their associates, peers and neighbors.

The engineer through the years has been an isolated individual left in his own world without benefit of fanfare or accolades. He has shunned center stage, and has avoided the politics of society and change. Generally, the engineer has been respondent only to technical problems and is little involved in civic service or in resolution of human problems.

Public relations, civic affairs, the social order, financial matters, and management in industry seem to be beyond the limited aspirations of the engineer. How many of our Section members have dedicated themselves to civic duties other than those that are technical, such as planning boards, board of appeals, etc., and how many have contributed time and effort to improve the image of the engineer, as in community projects, fund-raising, etc.?

The engineer through his training and background is generally credited with high integrity, analytic mind and sound judgment, but he has fallen into the error of reacting to society's problems only when they touch his own limited world. He has had little regard to the need for bettering his professional image in the civic and financial fields mentioned above. The engineer has received recognition for his educational and technical ability, but has not made progress in upgrading his stature, professional development and standard of living. Many have argued that the fault lies in the manner in which engineers do business;*or* that the engineer does not meet the public on a one-to-one basis, as other professionals do, such as doctors, lawyers, dentists, accountants, etc.; *or* that the engineer by nature is easygoing, content to exert his technical prowess and sustain his personal needs. Is this really true of us?

Technical Training

I do not intend to be critical of the academic approach or necessarily of engineering school curricula, but there is a need to reassess them so that engineering students may develop talents in fields other than technical. The

student engineer is so burdened with technical studies, laboratory work and reports, that very little time is left for him to participate in subjects which will broaden his personality and make him more worldly and outgoing. There is a definite lack of such courses as humanities, literature, law, effective speaking, and the arts. The engineer tends to avoid courses like these; his attention is directed to technical aspects and there is little encouragement to have him to devote time to subjects in the area of liberal arts.

I think that if we could obtain factual data on the development of the engineer in practice, we would find that the typical engineer's time is spent over his career as follows:

age 24-35 years:	50% technically oriented, 50% project control and management.
age 36-52 years:	20% technically oriented, 60% project control and management, 20% administrative.
age 53-retirement:	5% technically oriented, 20% project management, 75% administrative.

Thus the engineer's technical training is most useful in the early years. He moves rather quickly into project control and management and then administrative assignments. The engineer in many cases is not properly prepared for this course of events. The lack of training for the things he is faced with after a few years, and lack of familiarity with other disciplines, may make him unsure and somewhat introverted. This has been clearly shown in the last ten years in the area of community relations and citizen meetings, where the engineer's work is presented but discussions are often led by other professionals. Because the engineer is not trained to express himself well in layman's language, and because he does not have the aggressive approach to communicating on the broad scale of a situation, he may use a narrow technical approach in setting forth his conclusions, and may tend to disregard social and economic factors. As a result, in many cases he has been replaced by others in the areas of urban problems and sensitive issues. Engineering educators must recognize this *debit* in the makeup of the engineer. In recent years we have seen some signs of changes. One particular effort is by our own Professor Richard Scranton, of Northeastern University, where a dramatic change has taken place in the approach being used to prepare the engineer for society. Engineers, through this program, are working with underprivileged and handicapped children, raising funds, constructing facilities, and getting involved with politicians, business leaders and other professionals. What an exciting development! Can you imagine what this might lead to, especially if we go beyond and make this an integral part of the curriculum?

The Way We Practice

The way we handle our engineers is a matter of concern to our members and even to the public. We do not really have a systematic method of guiding the engineer through the various stages of his career. In most companies there is no real internship or breaking-in program under which, after a certain period of time, it can be definitely shown that a young engineer has sufficient practical experience and is eligible for certification or registration. ASCE has over the last few years made significant progress in establishing guidelines for the classification and compensation of engineers. But they are only guidelines, not enforceable in the firms or agencies where engineers are employed, and thus do not effectively provide and protect the engineer and his rights. I am not interested in having ASCE or any other professional society serve as a union, association or other labor-protecting group, but the Society must impose measures to upgrade and professionalize its own members. Most medical, dental and legal associations have very stringent rules and regulations for the education, grooming, and practice of its members. In the field of engineering it is not the same; practice is regulated only by boards and associations which may be controlled by political authorities or other special interests.

In the last thirty years we have seen dramatic changes in the trends of employment of engineers. More of them have gone to public agencies and have become responsible for disposition of large funds, for negotiating with engineering firms and awarding contracts. Thus, many of the people we deal with are our engineering brothers and sisters who have sometimes made very difficult demands in the processes of selection, award and contractual arrangements. This becomes a very serious problem because the contract terms eventually control the direction of our firms, compensation for employees, and the benefits and protection we can offer them.

Some form of indoctrination must be instituted in the family of engineers to spread through the profession the doctrine of moral responsibility and to raise the standards of the profession. There is a need to have an understanding in the fraternity of engineers to not only provide for the needs of society but to apply these same actions to fellow engineers. It almost appears that an oath of responsibility should be hanging in every engineer's office to remind him continually of this point. We constantly see around us the marked advances made by other tradesmen, skilled and unskilled laborers, and professionals, but the engineer just can't seem to benefit by his professional stature.

Influence of Society

As society becomes more affluent and technically oriented, greater demands are placed on the engineer to provide the knowhow not only to protect man and his environment but to make the world a better place by

providing and increasing its resources. Over the last two hundred years and especially the last fifty years, we have exploited our natural resources, and little consideration has been given to the future generations. I have always maintained one basic philosophy in regard to the planning, design and construction of facilities, and that is to be sure that the facilities are not permanently destructive, and that after they serve their usefulness the area can be restored to its original use. Man's demands are continuously increasing and as our population increases the demands of society will place greater emphasis on providing clean air and water, on disposing of sanitary waste and refuse, on transportation needs of a mobile society, and on the ever-increasing need to rehabilitate and reconstruct our older cities and towns.

Unfortunately, the engineer is not in the position to establish priorities and the allocation of funds for projects. Outside of the private sector, most of the projects have federal funding and therefore are influenced by federal spending. The needs of society are subject to the whims of politicians or federal agencies that have special interests to satisfy. Thus, the engineer is at the mercy of factors beyond his control. With the increasing needs of society, a definite strategy for providing greater research and resources must be developed to resolve the problems of the next generation.

Modern society, in many cases, does not have the appreciation of the planning necessary to ensure that we continue to make positive progress in tomorrow's world. Our forefathers were better strategists or foreseers than most realize. We eat and drink by use of facilities planned, designed and constructed by them. What we have done lately is to create a more involved network and chain of command to hamper the wheels of progress. There are many times when decisions will be made contrary to the public good and for those with special interests. It takes a dynamic administration or agency to push through the planning, design and construction of facilities that can serve future generations. To stall the wheels of progress is really to dodge the challenge of today and pass it over to our next generation.

The Role of Government

Last year at this time President Charles A. Parthum stressed the degree and extent that government has become involved in the process of generating projects. Today, I would like to emphasize this even more as to the extent and impact it is having on the private practice of engineering.

As recently as two months ago, President Carter invited the administrators and presidents of many of our leading private colleges to a conference in Washington, DC, and one of the remarks by a leading educator was significant: "... the government by its participation in various programs or funding of studies at the universities or colleges has put excessive demands on the administration on paperwork, administrative duties, and on enrollment of students, and just about every other right that an educational institution has

in running its own affairs. To put it another way, it has given us a button for a coat, and is now telling us how to style the coat, make the coat, and what color it should be. . . ." The same kind of conditional regulation has developed in the practice of engineering and in the construction field.

The pity of it all is that free enterprise is no longer free and is becoming totally government-directed, supervised and regulated. Industry's own methodologies, systems, and approaches to solutions have come under the thumb of government agencies that are so obsessed with regulations and documentation that private institutions cannot progress in a positive way. My particular concern is about the negative effect that the government role is having on the whole practice of engineering, from the educational process to practice in the office or field. Continuously the younger engineer is becoming disillusioned in the way engineering is practiced, for the regulations begin from the time he procures work. The writing of the contract, the amount of compensation, the people hired, the design of the system, the format of the bidding, the award of construction work, and even the way it is managed and operated is all government-regulated and directed.

Is this really the right of government, and what is government anyway? In my opening remarks I quoted Walter Lippman, who said, ". . . in a free society the state does not administer the affairs of men. It administers justice among men who conduct their own affairs. . . ." I believe it is time that the government reassess its role and permit the free-enterprise system to be really free again.

Let me conclude by leaving you with these thoughts:

Shouldn't we and why can't we reassess our role in society?

Do we need a reappraisal of our undergraduate training of engineers?

Is it possible that the free-enterprise system can administer its own affairs?

I am concerned and I'm sure some of you are concerned, so why not work together to improve our image and position.