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THE TIME FOR REEVALUATION

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The Boston Society of Civil Engineers was founded 122 years ago when six engineers met in the United States Hotel to form a society to promote "social intercourse and professional improvement". Later that same year, a celebration was held on Boston Common to inaugurate a modern water supply for Boston. The latter event was a striking testimonial to the growing technical ingenuity of the engineers.

This same ingenuity through the intervening years since 1848 has enabled the engineer to continuously increase the physical ease, improve the health and lengthen the life of mankind. Pure water supplies were developed. Sewage was collected and carried away. New devices without number were conceived and produced. Life became more exciting and less arduous with each passing year.

People flourished with these improvements in their lives. The population of the United States increased ten fold, from 23 millions to over 200 millions during these 122 years. The population of the world grew at a slower pace increasing from about 1.2 billions to about 3.5 billions. The use of machinery on the farms eliminated the need for large numbers of manual laborers. The result is that today there are fewer people on American farms than at the turn of the century, yet food is produced for three times as many people. In America today, less than 35 percent of the population live in non-metropolitan areas. We are truly an urban society. Never have the vast majority lived such a good life.

The mind of the engineer, as he looks down from his ivory tower of accomplishments, is troubled. Things don't seem to be right. We are in a war in the Far East. War threatens us with involvement in the Middle East. Large numbers of people are dependent on the government for welfare. We are told that our water, air and land are polluted, that we have a drug problem and a generation gap with our children. The engineer is puzzled. Why, with all of these luxuries unknown to previous generations, are people dissatisfied? The question that nags at his conscience is "Was it my wonderful work which brought us to this condition?" The answer to this question is not readily apparent.

Let us examine some of the evidence. At a recent meeting of our Society, a spokesman for the electric power industry described the advances that his organization was making in reducing the amounts of pollution discharged from the stacks of fossil fuel generating stations. He assured his listeners that great strides were being made in the design of new plants so that only a fraction of the present discharge of pollutants would occur in the future for each ton of fuel burned. However, he went on to say that due to increased power demands, it was necessary for the industry to construct larger and larger plants at an ever increasing rate. Therefore, in spite of the improvement in the effluents, there would be more pollution discharged into the atmosphere in the future than is now the case. However, he reassured the audience that the stacks would be built higher and the plants would be more widely dispersed so that, at ground level, there would be less pollution. For someone who grew up with the idea that everything that goes up must come down, this reasoning is a little hard to understand. Furthermore, there is some fear that excessive carbon-dioxide in the air is causing unforeseen climatic changes.

I believe that the above example applies to many sectors of the environment. It stands to reason that an increased population will need more shoes, more textile products, will burn more fuel to heat their homes and move their automobiles. Our growing country will produce more sewage, more trash, and in general put more and more stress upon the physical environment. I likewise believe that more and more people, living in close proximity, will create stresses on each other. I think this is especially true in a nation to which these conditions are relatively new, a nation which does not yet fully realize that these stresses even exist.

It is unrealistic to expect that engineers will be able to reverse the population trend to which their ingenuity has contributed. We must leave this to the social scientist. Therefore, what should engineers be doing? Is it possible that engineers could turn their ingenuity to the creation of an environment which would tend to relieve, at least in part, the stresses in modern society? Could they create an environment in which many people can live lives of satisfaction and fulfillment? I think that they can if they realize the importance of doing so.

What are some of the stresses to which we are all subjected? In a modern city, why should pedestrians be exposed to the elements — the rain, snow and blazing sun? Why should the pedestrian in the city compete with automobiles and trucks for space on the streets? How many pedestrians have been irritated by being splashed with mud from a passing car, or from step-

ping into a puddle of cold water which goes above their overshoes? Why should our nostrils and lungs be assailed with the effluvium from automobile and diesel truck exhaust? Is it necessary for the wheels of the subways and the streetcars to screech with an ear-deafening noise as they pass around the curves?

Cities which were in use in 1848 with their relatively small populations are obviously no longer suitable for modern living. They must be reconstructed. How are we going about this reconstruction? We are building super-highways, parking garages and apparently doing everything we can to give the automobile an even greater advantage over the pedestrian. Have we done anything for the pedestrian? In a few locations, we have built some steep steps by means of which he can climb to an overhead walkway, usually windy, which he can then use to cross over the traffic. Can such devices be considered an encouragement to walking? How much has this neglect of the pedestrian contributed to the recently noted decline in the life expectancy of Americans? It seems to be a backward step in two ways: more pollution and less exercise. Perhaps we should stop looking exclusively at machines and more at people.

Beyond the minor irritations of daily life, what consideration will need to be given to the means for providing people with housing, working space and entertainment in an ever more crowded space? This will undoubtedly mean higher and larger buildings. What kind of planning will be necessary for a city comprised of great buildings to function in a manner which will provide not only a bearable life to its inhabitants but a life which is truly worth living? Consideration will have to be given to the relationship of each building to its neighbor. Consideration will have to be given to the view from each window of each apartment. Each series of buildings will have to function as a working unit and reduce the need for people to travel great distances to obtain the necessities of an amenable life. They must be designed to encourage a change in present living habits which are rooted in rural life.

As the urban sprawl continues to spread its tentacles across the countryside, many people are becoming concerned that irreversible, at least within the foreseeable future, damage to the environment is occurring. The alarm of these citizens is well founded. Furthermore, they have raised their voices to sound a warning. All engineers should heed this warning.

The rising tide of people who are becoming conscious of the loss of values which cannot be expressed in terms of dollars, provides both a challenge and an opportunity to the engineer. The challenge concerns the abili-

ty of the engineer to continue and to expand the facilities and services needed to protect the health and comfort of a growing population and to do this in a manner which will enhance the environment from both a physical and an esthetic point of view. The opportunity presented to the engineer is equally as great as the challenge. Those who are concerned with our future are to a large extent ignorant of the means available for the preservation and enhancement of the values they feel we are losing. The engineer with his technical knowledge, his understanding of the fundamental factors involved, and his ability to develop new techniques, is in a unique position to provide the leadership which is vital to the success of our future environment. However, before the engineer can provide this leadership, he must recognize the problem.

If the engineer is not convinced that the problem exists, and if the engineer fails to exercise the leadership of which he is capable, there are others less qualified, ready and willing to furnish leadership. In general, engineers have been negligent of their duty in this area. Unless they wake up and assume the responsibilities which are rightfully theirs, they will have only themselves to blame for the conditions which will be the inevitable result.

What is it that each of you can do individually and collectively to provide leadership in the battle to maintain and improve our environment against the encroaching needs of the expanding population? The initial decision of any group of people to carry out a concerted policy is a political decision. Hence, if engineers are going to be leaders, they must enter the political arena. How can this be done? One of the first things that I think each of us can do to a greater extent than most of us are presently doing is to become members of, and lend our support and our specialized knowledge to those groups which are trying to attack these problems. Almost every town in the Commonwealth has a conservation commission. How many of these conservation commissions have an engineering member or an engineering advisor? Almost every town has a planning board. How many engineers are serving these planning boards either as members or advisors? How many of you have volunteered to serve on or advise a committee concerned with revisions of the building code in your city or town? Many of you are concerned that you cannot afford the time to serve in these positions. It takes too many evenings of the week. Perhaps the time has come when you cannot not afford the time. In my opinion, when a man applies for an receives a license to practice engineering, he has accepted a public responsibility as well as a license for personal profit. This responsibility is to serve the public with the best of his talents. The same applies to our engineering societies. They must give more attention to their social responsibilities, even at

the cost of loss of tax-free status. We do not live alone. Like it or not, we are the people. The time is now. The future will not be built tomorrow; it is being built today.

In summary, the problems with which engineers are faced today may resemble on the surface those that were faced by the engineers who founded our society in 1848, that is, to supply people with pure water, adequate housing, collection and disposal of sewage and refuse, and adequate transportation. However, the resemblance between the problems of 1848 and 1970 is superficial. Just as the technology has changed in 120 years, so have the real needs of the public whom the engineer has agreed to serve. It is time that the engineers closed the philosophical generation gap between the founding engineers of 1848 and the basic needs of 1970 and the years immediately in the future.