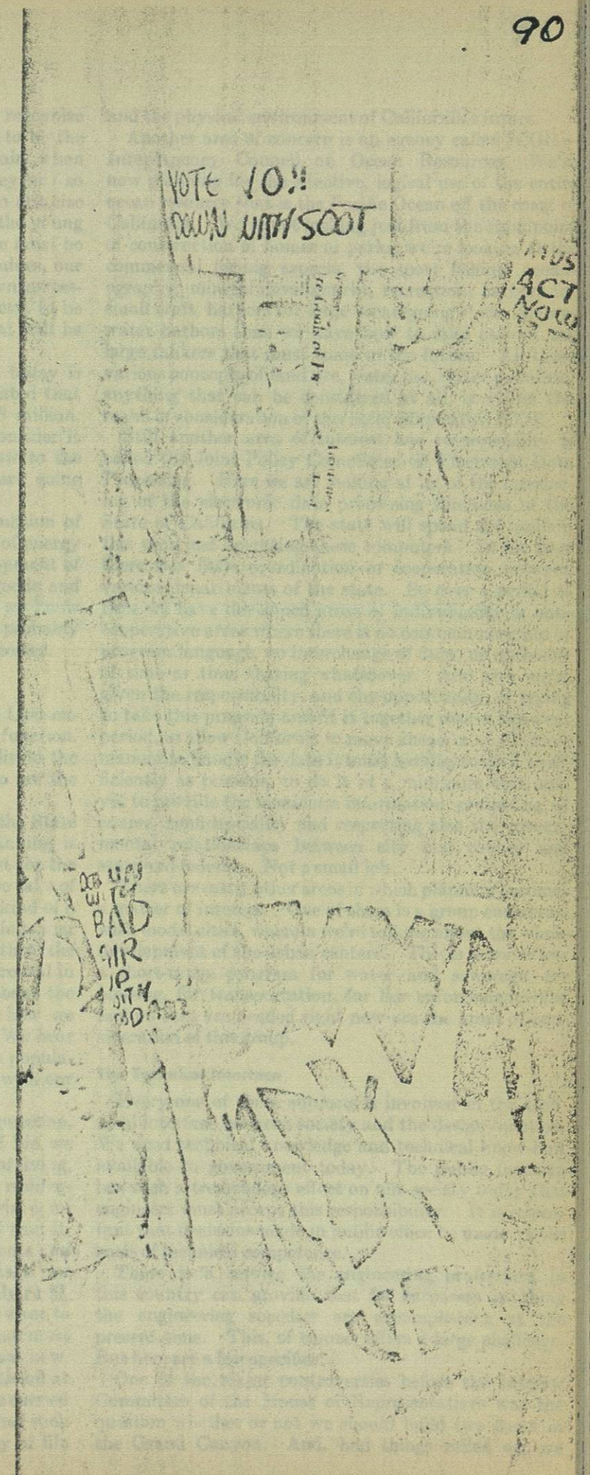
POLLUTION—POLITICAL EXPEDIENCY AND TECHNOLOGICAL COMPETENCE



Our increasing population is polluting itself out of its water and air supply. The doomsday prophets are giving us 10 years to reverse the damage. However, Federal efforts to control pollution have begun to produce a considerable volume of legislation, but many decisions are being based on political expediency rather than technical competence. Hence, it is vital that engineers become involved in making those decisions that will determine the directions and development of our society.

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THE CHANGING ENVIRONMENT of California can be divided into four basic areas: air, water, land, and urban society. Hence, it is not just a question of the conditions of the air quality in Southern California or the water quality. Rather, it is a total program involving people, from the universities to the ghettos and all of the things that they look for in their quality of life. The engineers of today and tomorrow must become vitally involved in this. We have the building blocks but we must learn how to use them, how to put them together.

Values are on the line; values are being critically

analyzed. And the young people of today recognize that what we do with society today is going to be the world they have to live with and maintain when they become adults. That's the reason they are so outspoken, and the reason they are willing to criticize and condemn. If we are to offer a legacy to the young people of today, to the world of tomorrow, we must be willing to scrutinize our own assessment of values, our own assessment of technology today, our own assessment of ourselves and our efforts in this society, to be sure that what we do leave is something that will be valuable tomorrow.

For example, the population of California today is about 20 million. It is conservatively estimated that by the year 2000 this population will be 38 million. This is a pretty drastic increase when you consider it took roughly 200 years for California to grow to the 20-million level, and in only 31 years we are going to virtually double that population.

Recognizing, also, that the rate of consumption of consumer products, of goods, of services, and of energy are going up far faster than any linear development of the population itself, we can say that the goods and services required to support the kind of life we know today at the end of that 31-year period will probably be five times the goods and services required today.

Plan Today for Tomorrow

Several of the responsibilities of the Office of Lieutenant Governor are concerned with the planning function. Therefore, all of this is very relevant, especially to the young people and certainly to the people who are the doers, the makers, the designers of today.

One such responsibility is jurisdiction over the State Office of Planning. The State Office of Planning is charged with devising statewide plans, not just for the sake of conformity with federal law, but for the sake of developing that kind of a population and that kind of a quality of life we are really looking for in that year 2000. An interesting outcome is the fact that the young people are saying today, we're not interested in talking about air pollution, we want to talk about the root causes: people. We want to find out how we can do something about population control We hear repeated statements, drastic statements of how population should be controlled as a means of dealing with our expanding society and population.

Assuming we are going to double the population, we need to think in terms of the quality of life we are looking for, the type of dwelling, the type of living, whether we want to build industrial cities and residential communities far separated from the industrial complex, connected perhaps by some form of rapid transit, or whether we want to live in high-rise apartments and building structures such as we see in some parts of our cities today. Whether we want to go completely rural, whether we want to decentralize or whether we want to centralize. There are many considerations that must be taken into account *now*, not a few years from now. It's not something that we can go on doing a little bit at a time. Plans must be made and plans must be carried out. This is why the State Office of Planning has such a vital function in terms of shaping the quality of life and the physical environment of California's future.

Another area of concern is an agency called ICOR—Inter-Agency Council on Ocean Resources. We're now planning for the effective, logical use of the entire ocean resource that is the Pacific Ocean off the coast of California. We're not looking just from the standpoint of construction of homes or parks, we're looking at the commercial fishing aspects, the sport fishing, oceanography, mineral development, recreation, harbors for small craft, harbors for large ocean-going ships, deeper-water harbors than we have now to take care of the large tankers that must come in the future. All these various concepts of land use, water use, water pollution, anything that can be considered at all, is within the realm of consideration of this little office called ICOR.

Still another area of interest and responsibility is called the Joint Policy Committee on Electronic Data Processing. Here we are looking at all of the interlacing of the electronic data processing functions of the State of California. The state will spend $55 million this year just operating those computers. In the past there was little coordination or cooperation between various departments of the state. So over a period of time we have developed areas of individuality in non-cooperative areas where there is no common program or program language, no interchange of data, no exchange of time or time sharing whatsoever. And now we're given the responsibility, and the opportunity, of trying to take this program and fit it together over a five-year period, to allow California to move ahead in an effective manner to handle the data it must handle, to do it as efficiently as possible, to do it at a minimum cost, and yet to provide the maximum information, protecting, of course, confidentiality and respecting also the governmental relationships between city and county and state and federal. Not a small job.

There are many other areas in which planning becomes a matter of interest. One of them is a group concerned with model cities, wherein we're talking about the whole development of the urban centers. This is more or less a short-range program for water and sewerage, for housing, for transportation, for law enforcement—the factors that are needed right now are the areas of consideration of this group.

The Technical Interface

Every one of these subjects is involved in the technical interface between society and the design function. We need technical knowledge and technical know-how available to government today. The public function has such a tremendous effect on our society today that engineers must accept this responsibility. It is important that decisions made in public office be made on the basis of technical competence.

There is a service the engineering professions in this country can provide that far surpasses anything the engineering societies are accomplishing at the present time. This, of course, offers a large challenge. But here are a few specifics:

One of the major controversies before the Interior Committee of the House of Representatives was the question whether or not we should build two dams in the Grand Canyon. And, had things rolled on, we

The Towne Lecture

The Towne Lecture is in honor of Henry Robinson Towne, President of the Society in 1889, whose paper in 1886 on "The Engineer as an Economist" initiated the flow of valuable Society contributions on scientific management. The Towne Lecture gives opportunity for an outstanding leader in the field of management, economics, or business to reveal his experience—preferably related to the scientific method in industry or business.

would have had the authorization for those two dams today, but for the fact that there was one conservationist, Representative John Saylor of Pennsylvania, and one engineer, myself, on that committee. The two of us took on the task. He took it from the conservation point of view; I took it from the engineering and the economic point of view, and we analyzed these dams backward and forward. We found out what they would do and what they wouldn't do. And when we could not get adequate answers from the Department of the Interior, we had to spend nights generating the data. Without getting into the details of what went on with those dams, the mere fact there was someone on that committee who could ask technical questions, and when answers were provided, could ask follow-up questions, and someone on that committee who was not forced to accept blindly whatever was offered to him by the representatives of the Administration, was to a major extent what made it possible for us to see that legislation in a different light. As you may know, we passed that legislation but neither dam was included. Here was the possibility of spending close to a billion dollars to do a job that would not have been feasible. Later it was admitted that it was a very marginal project and that they probably couldn't have done it.

Another specific example: The Air Quality Act of 1967 was before Congress. It was proposed by the Secretary of Health, Education, and Welfare that there would be one national standard, a maximum standard, for all air quality in the U. S. Logic and reason don't agree that the same air standards should prevail in northern Idaho as there should be in Los Angeles. It became a fight on the floor of the House. Since I was the only engineer from California, I was given the opportunity to lead that fight. We were able to convince the other members of Congress there were considerations that dictated more strict standards for California, and as a result we were able to win the amendment which gave California the right to establish air quality standards more strict than the national standard which the Secretary wanted to impose. Simply because one member, an engineer, could explain words like carbon monoxide, carbon dioxide, the oxides of nitrogen, and hydrocarbon, was one of the reasons California is now establishing more stringent air standards. Had we not won that particular amendment, California would be restricted from doing anything further about her own air quality unless the national standards were also raised.

So you can see the tremendous impact of a little bit of technical competence in such a situation.

The Engineer's Role

It is important, therefore, that ASME, for example, not be satisfied just with the excellence of a particular design or a mechanical concept, or of complete mastery of the knowledge and laws of physics and materials, but to recognize it has a public responsibility that goes as far or farther than technical competency. If ASME doesn't accept this responsibility, other parties will—and those other parties may not have technical competence. Those other parties may make decisions based on political expediency rather than on logic. This is one of the real conflicts prevalent in governmental circles today. It's not enough for governmental bodies to be able to hire excellence in technology. It's mandatory that governmental bodies also involve and have technical competency in making the decisions that determine the direction and development of our society.

ASME should start something new—a public affairs program that will, for one thing, enhance and improve the image of the engineering profession. All too often we are talked about as the fellows with the bow ties, the saddle shoes, and the slide rules. That's not really the case, but the public still sees the engineer as a very sophisticated technician and nothing more. He must be recognized as something far more than just a technician.

Beyond that, ASME should develop programs to involve its members—particularly the young people coming out of schools that are student members—in becoming interested and involved in governmental affairs, even if it means contributing some time to your city council, or your county board of supervisors, or whatever level of government might be available or accessible. This kind of service is necessary. The values which you can contribute will not only do a great deal to enhance the future of the engineering profession, but will do a great deal to enhance the quality of the society in which you live. This involvement, plus perhaps the personal involvement of yourselves as candidates for the highest possible level upon which you can serve in public life, will become a matter of awareness in your own mind and in your own evaluation of your function in life, to make it possible for us to find in the long run that quality of life we seek.

In short, engineers should be advocates of logic and reason in governmental circles, rather than sitting back and remaining in staff positions or in the position of critical analyst after a project has been accomplished.

If, in fact, all the technical societies can move together in this regard and bring forward the rational use of our technical competence, then we can find that quality of life, that environmental control, we are looking for. If we move ahead only with the idea in mind of building bigger bridges, bigger steam shovels, or faster cars or taller buildings, we will miss the mark; and we will miss a part of that public responsibility which the mechanical engineer should exercise.