

Accepting the Challenge

By William J. Coad, P.E.

2001–2002 ASHRAE President

ASHRAE President James Wolf's theme for this past Society year was *Engineering Tomorrow's Quality of Life*, and as we move on into the coming year, let's dwell for a moment more on "quality of life." At no time before in the history of the human race have people enjoyed the quality of life that we do. One hundred years ago, the wealthiest, most powerful people couldn't enjoy the quality of life that every person in this room has today. I'd like to start by taking a brief look at the past.

Let's take two snapshots from relatively recent history. The first occurred 200 years ago, in March of 1801, when Thomas Jefferson was sworn in as the third president of the United States. Historian Stephen Ambrose, in writing of that event, stated the following:

"A critical fact in the world of 1801 was that nothing moved faster than the speed of a horse. No human being, no manufactured item, no bushel of wheat, no side of beef, no letter, no information, no idea, order or instruction of any kind moved faster. Nothing ever had moved any faster, and, as far as Jefferson's contemporaries were able to tell, nothing ever would."

Then the engineers and scientists got busy in the 19th century unlocking the secrets of matter, heat and work. And in the relatively short time span of that century — through scientific observation and engineering curiosity facilitated by a political climate of relative freedom — they developed the laws of forces, motion, thermodynamics, electricity and magnetism and gave birth to the industrial revolution.

The second snapshot is taken about 100 years later near the end of the 19th century in the year 1894 — the same year in which 16 engineers gathered in Lower Manhattan and founded the American Society of Heating and Ventilating Engineers (ASHVE), one of our predecessor societies. In that year, an author and playwright in London named Oscar Wilde, writing on an entirely different subject, made the statement:

About the President

William J. Coad, P.E., Fellow/Life Member ASHRAE, is a senior principal and past board chairman of McClure Engineering Associates in St. Louis. He joined ASHRAE in 1965 and has served on committees at the chapter, region and Society levels.

Mr. Coad has received the Society's Crosby Field Award for the best paper presented during a year, the Distinguished Ser-

"... On mechanical slavery, on the slavery of the machine, the future of the world depends."

And, about that time the engineers were shifting into high gear. During the 20th century, the engineering community created the mechanical slave indeed. The mechanical slave or robot has served up our quality of life. The robot washes our clothes, cooks our food, cleans our dishes, moves us about over short distances or long at varying speeds, exceeding the speed of sound, provides us with untold entertainment and pleasure, stokes our fire, provides us a healthy and comfortable environment, preserves our food, performs our calculations, reinforces our knowledge, keeps our records, delivers our messages anywhere in the universe at the speed of light, and provides our recreation.

That's the time we live in as we start the 21st century — all made possible by the engineering community.

But wait — the robot must be fed, and its food is the nonreplenishable energy resources of planet Earth, which are rapidly depleting. Its effluents are contaminating the fragile environment on which our very lives depend. And therein lies the challenge.

The greatest challenge to the human race in the 21st century will be to maintain and advance our quality of life as we face a dwindling reserve of energy resources. The situation, in a nutshell, is:

- The energy reserves of the Earth are being depleted at an exponentially increasing rate.
- There will be a serious shortage of readily available reserves in the not-too-distant future.
- Many of these reserves are well beyond the control of the countries that represent the largest consumers.
- Loss of the energy to power the economy and lifestyles of the consuming countries would create an economic and social disaster of immeasurable proportion.
- The engineering community has the ability to design machinery that uses significantly less energy to accomplish the same purpose. Compared to most current practices, with no advances in technology much less energy could be used to accomplish the same results.

vice Award, the Louise and Bill Holladay Distinguished Fellow Award, and the F. Paul Anderson Award. He is a past president of the St. Louis Chapter. He is a recipient of the Region VI Regional Award of Merit. He has written two books, 11 papers and more than 100 articles.

Mr. Coad earned a bachelor's degree in mechanical engineering from Washington University.

- Properly applied design philosophy will result in lower investment costs for systems that use less energy.

- The only long-term or permanent solution is to achieve a world society based upon sustainable technology.

And of course, the flip side of the coin of challenge is that the environmental sink is not infinite. As we re-design our robot, we must also ensure that the effluents are compatible with the chemistry of the natural environment.

And the only sector of society that can possibly solve this problem is the engineers! Why? Because it is the engineers who have created this "quality of life," and only the engineering community has the knowledge and the skill to keep it going.

This one can't be left to the legislators, litigators, politicians, advocates, activists, bankers, economists, business leaders or opportunists. Although they will all have a critical role in facilitating the change, the engineering community must assume the leadership.

The fields of engineering represented by the 55,000 members of ASHRAE account for about 35% of the world's energy consumption. We have an obligation and an opportunity to make a major contribution to the future of humanity.

At the risk of being melodramatic — one could paraphrase Winston Churchill — "Never have so few had an opportunity to do so much for so many." We're in the pilothouse and no one else has control of the rudder! If the engineers take it now, we can set the course for the century — and thereafter, the millennium.

So, as your president for the coming Society year of 2001–2002, I would like

for you to give me the mandate to say we are *Accepting the Challenge*. And I, in turn, would like to ask each and every member of ASHRAE to join with me in that undertaking. This is not simply an activity to undertake and accomplish. It's the beginning of a long-range change in course. A change in philosophy. A change that will give new life and a new sense of purpose to our Society.

Now let's explore in more precise terms just what it is that ASHRAE and its members can do in accepting the challenge.

First, let's restate just what the challenge is:

- Humanity does and will continue to depend upon energy conversion to maintain and improve the quality of life.

- We must develop a means of satisfying this need by advancing the technology to ensure performance while first reducing the consumption of non-replenishable resources and, second, converting to replenishable, non-depleting resources or finding new energy sources.

- We must ensure that society's needs are met without the continuing degradation of our fragile environment.

- We must achieve this without decreasing the quality of life.

- We must recognize the overwhelming desire and need of

the 5 billion people of our planet who have yet to achieve our quality of life.

To meet this challenge I am proposing a program for ASHRAE, which I hope will become a role model for other engineering societies and associations.

The Program

Before doing anything else, we must share in the understanding of the challenge and of our ability to meet it. This is paramount. Unless we believe in ourselves and our essential role in resolving this issue, we will fail.

Next, we must seek the very best scientific or anecdotal facts upon which to mount our efforts. This is somewhat subtle but

absolutely germane to everything else that we do. It was only a little over 100 years before the American Revolution that Galileo died under house arrest for trying to teach Copernicus doctrine. But the Dark Ages are not all behind us! In many ways we have simply replaced the Roman Church of Galileo's time with influential sectors of society, various agencies of the state, or with business and financial institutions or those representing their interests.

Thus in all of our programs, publications, educational activities and research, we must seek a better way. If new information or better methods prove to be in opposition to the status quo, we must have the wisdom and courage to recognize and accept them and to manage the change. At first blush, such changes might be considered as detrimental to a strong economy or to

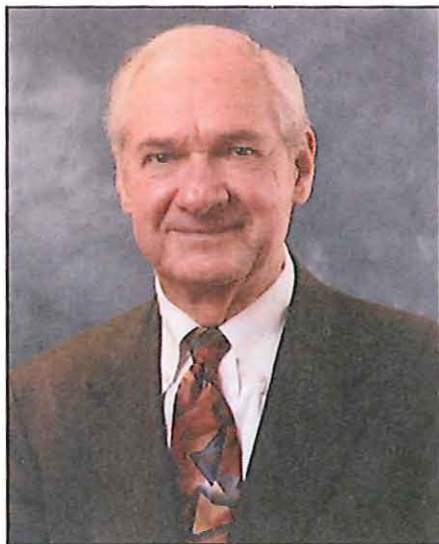
the special interests of certain financial or business sectors or institutions of the state. But those interests, also represented by members of our Society, must recognize both the inevitability of the change and the long-range benefits and thereby help bring it about.

We must advance the technology, not perpetuate it. The very premise of the challenge is that if society is to survive, change is inevitable. So if we are to advance technology, we must rely heavily on those activities that tend to do so. For those activities that tend to fix or set the technology, we must establish a mechanism for frequent and rapid updating and easy application for the user.

The activities that tend to *advance* technology include such examples as research, periodicals, short courses, seminars, dissemination of information and technical programs, and dialog on innovative system designs that addresses the benefits of new concepts and accepts the risks of failure.

Those activities that tend to *fix* technology include textbooks, handbooks, standards, codes and legislation of varying sorts.

To accept this challenge, we must place increased emphasis on the former, emphasizing those aspects that continually ad-



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2001–2002 ASHRAE President

Inaugural Address

vance the state of the art. And on the latter, we must address the need for rapid and frequent updating of the textbooks and handbooks. While recognizing the overwhelming need and benefit of standards to the stabilization of commerce, and codes to the benefit of the public, we must streamline our processes and the usefulness of these documents.

By way of suggestion, it seems that one of the most obvious solutions to accomplish the latter would be to break our large comprehensive topical documents down into more manageable and useable components.

ASHRAE is a volunteer organization, and we must all gain maximum benefit from each hour of service to the Society. So I challenge each and every chapter, committee and council, and each individual member, to focus on this challenge in everything you do this year with the immediate objective of redirecting ASHRAE during the next 12 months to lead the engineering community and society-at-large into an ever improving quality

of life in a sustainable manner.

In conclusion, if we *accept the challenge*, it could be the beginning of a technological renaissance. It requires all of us to

carry part of the burden of responsibility for moving our technology to the next level. We will all have to accept the mindset of change with both its benefits and its risks. But it will assuredly give us new purpose and a new pride in ourselves, our colleagues and our mission.

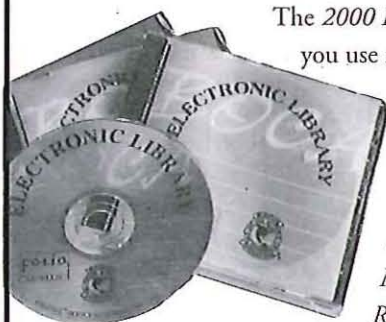
As a closing thought, I would like to quote Albert Einstein. When addressing an assembly of engineers

and scientists at the California Institute of Technology 70 years ago, he said:

“Concern for man himself and his fate must always form the chief interest of all technical endeavors, . . . in order that the creations of our mind shall be a blessing and not a curse to mankind. Never forget this in the midst of your diagrams and equations.”●

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