

Technology—Liberator or Destroyer?

WE are living at a time called by Astrologers, the "Age of Aquarius." To the Scientist, it is an "Era of Space Exploration." Technologically, it is a period of contradiction and crisis-contradiction because so much of the creative power made available through technological advance is being used to destroy rather than improve society; crisis because if this priority is not reversed, there is real danger of collapse of our social structure.

The cultural change which is now occurring is sometimes referred to as a "scientific revolution" leading to the "post-industrial" era. Our over-all way of thinking and interpreting the world is moving from a Newtonian orientation toward matter and mechanics, to one dominated by biological sciences in which life and organic processes are paramount.

The role of Technology as the "Foundation of Cultural Change" is explored by Harvey Wheeler in the July/August, 1972 issue of *The Center Magazine*. He points out that, whereas Churchill said that the scientist was to be "on tap, rather than on top," in the future, scientifically minded men will "rise to very responsible positions of social leadership," and "the guiding principles in human affairs will often be drawn from science." Wheeler continues, "... it is already true that if one could control the general character of scientific advance for the next few decades, one could thereby control the framework within which social change would take place." Choosing to put the major portion of research funds into weapons development rather than into the life sciences would make a considerable difference in the nature of the resulting social system.

Two scientific innovations have expanded man's horizons and provided tools for dealing with the problems and potentialities of civilization on a scale which was inconceivable prior to World War II. These are the invention of the computer and the harnessing of nuclear energy. These developments, however, have created their own sets of problems. Our social institutions, including man himself, are incapable of coping with the systemic implications of innovations of this order. Wheeler attributes this lack of capability to the "gap between the accumulation of scientific knowledge and technical competence with its additive capacity, compared with the nonadditive nature of philosophic, political, and deliberative wisdom." If we cannot comprehend a problem, we cannot recognize it; if we cannot recognize it, there is little hope that it will be solved. Wheeler suggests that most of our serious problems are ones we do not even recognize.

It is this situation which produces the technological crisis. If Technology is to participate constructively in cultural change, it must develop the ability to understand the nature of society and its needs. Perhaps this requires a new kind of scientific discipline—one which would investigate the interrelationships of the physical, biological, and social sciences and develop concepts of application of scientific knowledge within a philosophical framework which defines society's goals. Such a discipline would involve much more than injection of "humanities" courses into engineering and scientific curricula. It would include analysis of the nature of technology itself and the positive and negative ways in which it has been used in the past. It would also include study of human values and needs and the responsibility of the technologist in meeting them.

Even more urgent is the need for the technical community to examine its current posture in relation to the quality of life. To what extent is technological effort being directed toward destruction of life rather than its enhancement? Are we suppressing or resisting change in order to preserve a status quo which continues inequities and human suffering? If we are disturbed by our answers to these questions, what should we do?

The minds which conceived an antipersonnel bomb capable of spewing forth hundreds of small projectiles which can penetrate the bones of human beings hiding in bomb-shelter tunnels could most certainly develop new methods of bone surgery or eradication of disease. Laser technology which directs bombs to targets as small as a truck on a highway could without doubt be redirected to improve communications systems. If an airplane can be designed with capability for a dogfight with another, could we fail to solve the urban transportation problem with the devotion of a similar level of effort? If we can alter a country's ecology through napalm and bomb craters, can we not improve our own environment by developing systems to eliminate pollution and dispose of waste? The way an individual engineer reacts to these contradictions will depend on the dictates of his own conscience.

How does this relate to the *Journal of Aircraft* and its function as a channel for communication of technical knowledge? It is our view that the engineering profession has an obligation to use its talents and resources to liberate society from the constraints to happiness and well-being imposed by natural and man-made barriers. We wish to encourage the use of the creative potential of technology for constructive cultural change. We urge more research and development directed toward solution of human problems which, if ignored, can lead to social and political strife. We are anxious to publish the results of developments in aeronautical technology which contribute toward these goals.

At the close of another year, we are pleased to have the opportunity to acknowledge the efforts of the many people who contribute to the publication of the *Journal of Aircraft*. This year, two Associate Editors, Dr. Sheila Widnall and Dr. Carson Yates, have joined us. We welcome them, with appreciation for their commitment of time and energy to this important assignment and for the work they have already done in our efforts to make the *Journal* a useful source of information and knowledge. Our other Associate Editors, William Greathouse and James Dougherty, have continued to provide their talents unsparingly, and to them we are particularly grateful.

A special word of appreciation is due this year to retiring Associate Editor Herbert Goda who, from Volume I, Number 1, in January 1964, has shared in preparation of the *Journal of Aircraft*. His advice and counsel, in addition to the contribution of his technical knowledge in performing editorial tasks, have been most helpful. We wish him well in his further endeavors.

The leadership of Ruth Bryans, Director of Scientific Publications, is again acknowledged with gratitude for her continued battle to maintain the quality and usefulness of AIAA publications in the face of budgetary problems. Managing Editor Anne Huth deserves our special thanks for bearing the brunt of the many problems created by the idiosyncracies of editors, authors, and reviewers with characteristic grace, while managing her staff with efficiency.

We are grateful also to Copy Editor Ira Rosenfeld and Editorial Assistants Elena Carles and Teresa McLaughlin for their untiring and conscientious application of their expertise in our continuing efforts to maintain a high professional standard for the *Journal of Aircraft*.

Ultimately, the level of excellence of a publication such as ours depends on the work of reviewers who, without compensation except for the satisfaction of contributing to

technical knowledge, have devoted many hours to assuring the accuracy, readability, and relevance of Journal articles. Necessarily anonymous during the reviewing process, their names are presented below, as an expression of our deep appreciation for their help.

Carl F. Schmidt
Editor-in-Chief

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*Because it is difficult to include the Reviewers for September, October, November, and December in this issue of the Journal, they will be listed with the reviewers for 1973 in the January 1974 issue.