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Editorial

The Future of Technology

The threats to the survival of mankind have been many. Our attention to these has been focused often by social philosophers. As a well-known example, Malthus brought our attention to the problem of food supply for an increasing population. This problem was attacked by technology: first by the increase in agricultural yields through both hybriding and manufactured fertilizer; second by cheap transportation to move the food from where it was grown to where it was needed; and third, the most recent technology is the capacity for parents to regulate the size of their family. Another threat was massive warfare, like World War II. This problem was again solved by technology through the development of devastating armaments, plus their careful control. An important ingredient in these decisions is the democratic process which allowed for public information, public decision, and finally public pressure to motivate the machineries of government and individuals to make the necessary investments and dedications, respectfully, to achieve the selected results.

Having hopefully solved the ravages of famine and war, the social scientists have now turned their attention to two new problems; equality and environment. Again, our democratic society will listen to the arguments, sift through the data, and embark on programs to counteract these threats.

On the environmental scene, many of the scientists are winding their way through various deleterious effects and finding, perhaps, their causes. And when found, the causes are being alleviated with of course the usual unevenness that is characteristic of the democratic process. Those of us who believe in this process, while concerned, are not forecasting the end of mankind because this institution unlike many others is based upon feedback and is therefore capable of rectifying its errors.

But, the leading spokesmen for the environmentalists are not content with this feedback process. Simply, they wish, indeed demand, that the *causes* be removed, even before waiting to discover whether there would be any deleterious effects. And just what is this cause? It is technology, the strange, mindless grant, which having increased the food supply and suppressed war is now threatening, or so they would lead us to believe, the very existence of mankind.

This point of view has been summarized very neatly by Commoner.* His argument is three-fold:

1) Technology consumes the mineral resource of the Earth without replacing it. Examples are metals and fossile fuels.

2) The mineral resources are consumed in such a manner as to upset the environment and thereby bring physical harm to man; e.g., too much CO_2 in the air or nitrogen in the water. An essential part of this argument is that the harmful ingredients are manmade, e.g., nitrate fertilizer.

3) Technological organizations are accelerating these processes, because the life of these organizations depends on their constant growth and the increasing wealth they produce. That is, organizations produce goods which are not needed but, by paying their workers, make it possible for them to buy the things they do not need. Moreover, there are two important axioms: a) the growth of these organizations is uncontrolled (e.g., they grow as fast as possible); b) the faster they grow the more they upset the "balance of nature" through 1 and 2.

So, the circuit is complete and like a self-excited motor, doomed for destruction, unless controls are added. And it is technology which needs the controls.

However, it appears to me that there exist, in fact, technological solutions for the first two problems. For example, Commoner claims that most metals removed from the Earth are dispersed by wear and rust. This is just wrong. Most metal products in fact lose their usefulness and are then discarded. More valuable metals are reclaimed. For steel, the process of collection, purification, and reprocessing are often too costly, but in fact can be done even now. There is no doubt that technology can in fact reduce these costs, but what is required is the investment or the motivation for the investment. As for fuels, fluid hydrocarbons seem most appropriate for transportation. (We are already turning to other energy sources for stationary energy.) But it is not beyond the capability of technology to provide either the manufacture of artificial or reclaimed fuels or transportable energy sources. As an extreme, there is no physical law which prohibits the manufacture of hydrocarbons from carbon dioxide and water by using energy. This will not be accomplished by shackling technology, but only by motivating it.

The cry that man-made (artificial) products are bad for health is hardly new. In fact, the food and drug laws require careful labeling of products which contain artificial products, and reasonable quality control. Natural products (being good for one's health) are largely exempt from similar controls. One need not raise the subject of tobacco; the hundreds of deaths caused by carmine dye, a common food coloring, is enough of an example. Carmine is a natural dye and therefore was not subject to close scrutiny. But carmine dye is made from South American insects and, because of the unsanitary conditions of drying them, carried salmonella cubana, which is usually fatal to the very young or very old. Thus, artificiality is hardly a guide to hazardous products.

Finally, we come to the question of uncontrolled growth of technology. It appears to me that the proposal—which is to shut off the source of wealth—is antithetical to the issue of *equality*. The issue of equality is simple: the right to have (or buy) what everyone else has already. What is the answer that some ecologists put forth? It is to deny them these goods and services because it is bad for their health. It is therefore no small wonder that most disadvantaged groups view ecology as an unreal issue created to divert resources and energy away from them.

But technology can solve all three problems simultaneously: it can reclaim the discards of an advanced society, provide opportunities for social and economic advancement, and increase the wealth of the nation. Our democratic society must examine these issues and their proposed solutions, and then it need only provide the proper incentives. And these incentives can come only through public pressures on our political institutions.

* Barry Commoner, "The Closing Circle," *The New Yorker*, Sept. 25, 1971, pp. 49–99.

The Future of the AIAA Journal

For the first time in 5 years, the backlog of this journal has begun to decrease. This has been accomplished by a vigorous publication policy, by which we were able to increase the number of pages during 1971, in spite of a slight reduction in paid page charges. We were able to offset the increased printing cost primarily by other economic measures such as requesting the Associate Editors to assume some of the burden of handling papers during the review and acceptance procedure, which permitted a reduction in the office staff. In addition, the use of Synoptics for incremental but important advances has been extremely useful. Thus, in spite of a reduction in circulation of about 20%, we were able to maintain our viability.

It is too early to forecast the circulation for 1972, but further steps already have been taken to reduce the costs, for example, composition. In addition, we will be experimenting with computer-operated photographic type machines which may be much more economical than standard monotype machines. Other important innovations are being actively considered, for example, miniprints and graded page charges. In addition, we expect to complete our economic study of selective dissemination of documents.

We wish to report with pride that many of the imaginative suggestions for economic and editorial improvements came from the membership at large. These suggestions were examined by the Subcommittee of the Publications Committee and will be forwarded directly to the Publications Committee in the form of recommendations. We wish to gratefully acknowledge the fine work being performed by the members of this Subcommittee: namely, H. Norman Abramson, Nelson Kemp, Eugene S. Love, and Julius Lukasiewicz.

As far as authors are concerned, we expect to maintain most of the policies of the past. We expect that the ratio of acceptances to submissions will be about the same but, of the full-length papers, about 25% will be published as Synoptics. Authors should be alert to the criteria for Synoptics: in converting a report to a paper, for example, they will speed up the acceptance procedure considerably if they will submit a Synoptic if the work fits the criteria. We also expect to continue to give publication priority to papers for which page charges are paid.

We also have compared our situation with those of other societies. As far as we can tell, our response to the decline has been more imaginative, resulting in a much sounder present footing than most of other technical societies and their publications. We hope to continue this leadership.

During this stormy weather, Ruth Bryans performed admirably on the steering gear, while Anne Huth kept the flaps down. Our grateful thanks to both. Finally, we wish to acknowledge the excellent and prompt decisions of our retiring Associate Editors, John Hutchison, Charles Kruger, Paul Lykoudis, and Dan Olfe. They set fine examples for standards of excellence, and this is appreciated by all. Finally, a good word is in order for my secretary, Mrs. Irene Scanzillo whose careful record keeping has kept track of your papers during the initial editorial process.

George W. Sutton
Editor-in-Chief

October 1971

Reviewers for *AIAA Journal*, October 1, 1970–August 31, 1971*

Abbett, Michael
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Klosner, Jerome
Kobayashi, Albert S.
Koester, J. K.
Kolsky, H.
Kopp, Richard

* Because it is difficult to include the reviewers for September, October, November, and December 1971 in this issue of the Journal, they will be listed with the reviewers for 1972 in the January 1973 issue.