

Engineers—Join the Revolution!

There can no longer be serious doubt that we are in the midst of a revolution. Defenders of the status quo, or "the good old days" are rapidly fading away. Those who fail to join, or at least accommodate to, the wave of the future, will be overwhelmed by it. If this sounds like radical talk, it's only because it is. Candor will allow nothing less.

The revolution is taking place in life styles, in sets of values, in changing moral standards, and in personal and social priorities. In large part, these movements are the result of increased social awareness by the populations of the world, made possible by technological innovation in the sciences of communication, distribution, and agricultural production. Thus, engineers are already deeply involved.

Engineers have always been involved in the revolutionary process. To the extent that wars have been fought to promote revolutionary causes, technology has been a determining factor in the outcome. More important, however, the most significant turning point in human history (excluding religious events) was the Industrial Revolution—wholly dependent on engineering developments—and this was (relatively) bloodless.

Technology *almost* inherently contributes to progress for mankind, and therefore should, in times like these, be an instrument of revolution. *Almost*, but not quite. While technical development is basically designed to improve existing functions which serve society, it can have side effects which cause more havoc than the good achieved by the main thrust. Witness: the increased cleansing power of detergents vs their polluting effects; the decontaminating effects of DDT while destroying the ecological balance; the enormous benefits of air transport to society vs the use of aircraft to destroy people and property.

Technology can be used in the present revolution in either of two ways: to develop methods and devices aimed at repressing or resisting change—a futile exercise in the long run; or to aid and abet the legitimate goals of the revolutionary movement. The latter course is far more constructive and is, in fact, justifiable pragmatically as well as from an idealistic point of view. "Plus ça change, plus la même chose."

To be more specific, the time has come when the technical community including aviation—must recognize that not only its responsibility, but its survival lies in applying its knowledge and capability to the solution of basic human problems. This does not mean abandonment of research, development, and production in the traditional areas of transportation, communication and, to the extent necessary, in defense. Continued advances in these fields are required, to correct imbalances in wealth and resources, and to eliminate the *causes*, rather than the *symptoms*, of unrest and human misery.

At the same time, the vast reservoir of talent and facilities which now exists in the engineering community can be tapped to provide fresh approaches to problems related to the quality of life, including environmental control, urban planning, and mass transit as well as development of new materials and techniques for building construction, systems management, and administration. Aeronautical technology could have direct as well as indirect applications to these problems.

The aviation industry, particularly through the AIAA, has recognized these opportunities for service, in creating a technical committee on the "Application of Aerospace Technology to Society" and in devoting an increasing portion of

technical meeting activity to this subject. Further cooperation and coordination by Government is necessary, however, for these efforts to be fully effective.

The following quotation from a letter written by one of aviation's most respected advisors, Vernon Crudge, expresses this point succinctly. "Coming to the heart of the matter, we did not reach the moon using magic or abracadabra which has since been obsolesced. We got there by defining a goal, paying the price, and applying known disciplines in science, engineering, and physics to the task. We didn't even invent systems engineering—only the name systems engineering. And NASA was the agency."

Our objectives now can have added to them the cleaning of the atmosphere, the greening of the land, the pollution free automobile, the recycling factory, urban renewal, and all other like desiderata. Do we not still need the same disciplines in science, engineering, and physics that took us to the moon? May we not need the same people? Why should we not even use the same agency—NASA?

The Congress declared in the National Aeronautics and Space Act, as amended, that it is the policy of the United States that activities in space should be devoted to peaceful purposes to the benefit of all mankind. Our planet and its atmosphere, and its land and its water, is located in and is part of space. So is the moon, so is Mars. So is the air breathed by the astronauts both before they leave Cape Kennedy and when they arrive on the moon.

In NASA, we have a structure with a budget, an infrastructure with our great industrial capability and our vast educational system. Let us use what we have and not malign it. Let us use with pride the stepping stone of our space program to show that simultaneously it has given us the motivation and the means to deal with problems "at home" that are not in reality separate or requiring skills, disciplines, and know-how, that we do not possess under the organized framework of an ingenious society.

Engineers—seize the time! We have the power—and the opportunity—to make the revolution a success, for the betterment of all mankind.

1971 has been a year of assessment for AIAA publications. The problems of how best to serve the interest of our members and subscribers, within the budgetary constraints imposed by the Institute's limited income, diminishing support in the form of page charge payments, and the escalating volume of technical information produced by industry, government, and academic agencies, have been faced by the Publications Committee and the Editors. Solutions have been elusive, and interim decisions to meet immediate crises have been difficult. Major obstacles are still to be overcome.

Bearing the impact of those problems with characteristic stamina has been Ruth Bryans, Director of Scientific Publications and her staff, headed by Anne Huth, Managing Editor. We are indebted to them for their continued tolerance and tranquility of spirit in the face of human and system failures and the complexities and uncertainties introduced in the attempts to develop a satisfactory publications process and program. Our thanks go to each of them.

It is again our annual pleasure to acknowledge the invaluable services performed by reviewers who have unselfishly devoted their time and skills to the critical examination of manuscripts submitted for publication in the *Journal of Aircraft*. The editors are wholly dependent on these experts in their fields, to maintain the qualities of accuracy, readability, and relevance

for which we strive. Remaining anonymous during the reviewing process, their names are presented here in grateful appreciation.

Carl F. Schmidt
Editor-in-Chief

October 1971

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* 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.