

Who Needs a Wheel?

In the land of Ur, in 2707 B.C., a certain engineer announced that he had fashioned an object which would revolutionize the transportation system. He had named it, the "wheel." If properly developed and applied, he said, it would enable faster and more efficient movement of people and increased trade with the land of Oz. He needed help in building a vehicle.

The tribal council viewed his model and plans with skeptical eyes. Some said it would never work; others, that it would raise dust and obscure the sun. "We already see too much of those Ozians," they said. "Who needs a wheel?"

There have been roadblocks to technological progress since the beginning. Many of these have been political; others have resulted from suspicion or fear of the unknown. Columbus' voyage was nearly scrubbed for lack of financial support. Fulton's steamboat was ridiculed. The railroad was violently opposed in Philadelphia, as a threat to society and "the safety of our children." It has been argued that, "If man were meant to fly, God would have given him wings."

"Progress" is not an end in itself. To be "our most important product," it must be measured in terms of human values. At each stage in technological development, there should be challenge to assure that there will be a net gain in social benefits and enhancement, rather than degradation, of the quality of life. On the other hand, such challenge must be based on rational analysis of the best available data. The methods used must be able to stand the test of unbiased judgment by humanitarians as well as the disciplines of social and physical science. It is only through such critical evaluation that the thrust of civilization can continue.

Too often, in the age of technology, these constraints are ignored. In *The Greening of America*, Charles Reich observes, "... the imperative of technology, unguided by other values, insists that we produce it and use it without attempting to consider what it should and should not be used for, what harm it might do, what controls are essential to its use." Tom Wicker, in the *New York Times* (Dec. 3, 1970), calls this "The Everest Attitude," warning that, if the SST (which "... would apparently represent a purely technological advance of some magnitude ...") is to be built, "... it should be done with as much foreknowledge as may be had, and with as many safeguards as possible for the environment and for the human condition."

All of this highlights the need for the professional community to include in its priorities the exploration of the total impact of technology on society. There are certain caveats to be observed. As the technology becomes more complex, research and development become more expensive. To investigate the "total impact" may require use of unfamiliar disciplines. It is necessary to avoid the tendency to downgrade implications which may at first glance appear to be peripheral. We are sometimes impelled to search for "hardware solutions" when R and D seems tedious and retarding to achievement of a clearly defined goal. It must be evident to engineers and scientists by now, however, that the public interest is their primary concern. Comprehensive R and D is the surest way to make technology responsive to this concern.

Public support of Research and Development has provided the foundation of aviation technology since the Wright Brothers first demonstrated their machine to the Signal Corps. Much of this support has been disguised as "defense" expenditure. It has been fortunate that so many of the results of this effort have "rubbed off" in the form of civil applications to improve air transportation and general aviation. It is ironic to find highly emotional resistance to research and development programs which can contribute *directly* to civil progress rather than suffer dilution through the military complex. Such programs as VTOL, SST, and Hypersonic Transport development should, on the contrary, be welcomed as opportunities to reorient the country's scientific and engineering resources toward constructive humanitarian objectives.

The R and D aspects of technological programs must therefore be made clear to the public and to those charged with responsibility for public policy, so that arguments based on innuendo and false assumptions can be avoided. If this is to be done effectively, we will have to make sure that our homework is thorough and correct. We will also have to make certain that our planning does not include irrevocable program commitments before adequate knowledge is at hand to give confidence that "progress" will have only beneficial results. Perhaps this will involve some introspection into our own motivations, which might not be a bad thing.

It is our annual pleasure to express appreciation to those who have contributed so substantially to the publication of the *Journal of Aircraft*. Among these are Harold Hoekstra, who retired as Associate Editor during the past year after five years of outstanding service. We wish him well in his continuing activities in aviation as well as in his private life. We also welcome Dr. J. S. Przemieniecki, who has stepped into Harold's shoes and taken up the frequently arduous task of maintaining high standards for our Journal through the editing and reviewing process. Our other Associate Editors of long standing, Herbert Goda and William Greathouse, also deserve our thanks for exemplary service.

Ruth Bryans, AIAA Director of Scientific Publications, is due a special accolade this year, as she guides our society's efforts to provide members with the most effective publications program through significant changes. These changes have been under the inspiring leadership of our VP—Publications, Dr. Jerry Grey, whose untiring efforts merit the gratitude of all AIAA members.

Managing Editor Anne Huth has again earned our deep affection for her understanding and patience in dealing with editors, reviewers, and authors, all of whom could lead an ordinary person past the brink of exasperation. To all of Anne's staff, we are especially grateful for the devotion and professionalism which they apply to their work. This year, we would mention particularly Carol Poppendieck, Anne's assistant, and Dottie Hombach, Anne's secretary, who have borne the brunt of many problems with characteristic grace and efficiency.

To our authors, we extend appreciation for the time and effort spent in preparing manuscripts which have transmitted valuable contributions to the advancement of technology. We are particularly grateful for their helpfulness during the period of experimentation with Synoptics, and their tolerance with some of the inadequacies of the publications system, which we are endeavoring to correct.

Perhaps our greatest debt is to the reviewers, anonymous and unpaid, who have given generously of their time and

professional talents in aiding the editors to present material in the Journal which is useful, relevant, and accurate. They remain the primary arbiters of quality, without which an archive publication could not stand the test of time. We are pleased to have this opportunity to give them recognition.

Carl F. Schmidt
Editor-in-Chief

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* Because it is difficult to include the reviewers for October, November, and December 1970 in this issue of the Journal, they will be listed with the reviewers for 1971, in the January 1972 issue.