

AIAA Journal—Whence and Whither

AIAA Journal is advertised to be devoted to the advancement of aeronautics, astronautics, and propulsion; serving a society of engineers and scientists, bound together by a common interest in the problems of flight; and covering the field at its leading edge, research and exploratory development.

How well does it do its job? A review of our topic seems to indicate that we have been reasonably well attuned to the great issues of the day: turbulence, re-entry, the three-body problem, MHD, wakes, combustion, composite structures and materials, etc. Over the past two decades—a familiar time period for most of the audience and contributors of this Journal and its predecessors—we have traveled together a remarkably fruitful and exciting road. But the very success of these outstanding ventures gives the wise among us pause:

“As a mathematical discipline travels far from its empirical source, or still more, if it is a second and third generation only indirectly inspired by ideas coming from reality, it is beset with very grave dangers. It becomes more and more pure aestheticizing, more and more purely l’art pour l’art. This need not be bad if the field is surrounded by correlated subjects which still have closer empirical connections or if the discipline is under the influence of men with an exceptionally well-developed taste. But there is a grave danger that the subject will develop along the line of least resistance, that the stream, so far from its source, will separate into a multitude of insignificant branches, and that the discipline will become a disorganized mass of details and complexities. In other words, at a great distance from its empirical source, or after much ‘abstract’ inbreeding, a mathematical subject is in danger of degeneration. At the inception the style is usually classical; when it shows signs of becoming baroque, then the danger signal is up.” (John von Neumann)

Now this could apply outside of mathematics. It is possible—perish the thought—that perhaps some of our efforts appear “baroque.” Some of our colleagues, in the more applied sector of the community, think so. We think not, at least not now; but let us beware lest *AIAA Journal* become Muscle Beach.

And yet consider the message of Fig. 1. It would appear that immediately an age-old restraint—lifting capability—will disappear from astronautics; for Saturn V will launch 125 tons in near-earth orbit—or equivalently with a Centaur upper stage—10 tons on a trajectory out of the solar system; projected component capabilities are no less spectacular. Are we at the threshold of a new period whose emphasis will be in the utilization of the remarkable “state of the art” we have helped achieve?

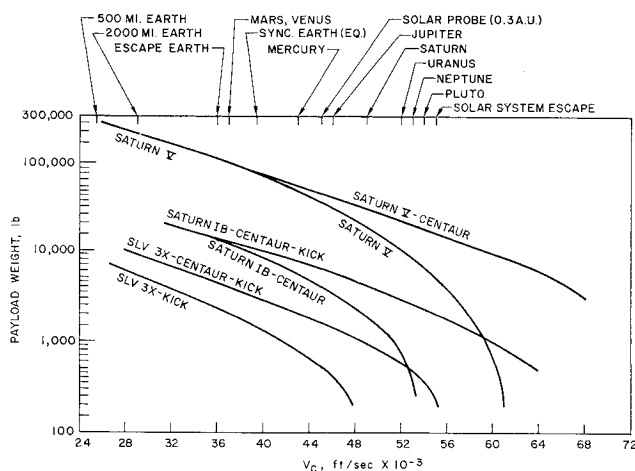


Fig. 1 1970-74 launch vehicle capability. Note: 1) all figures are based on an initial launch into a 100-naut-mile earth orbit followed by an impulsive acceleration of the payload to the characteristic velocity V_c and 2) launch vehicle from 1965-1969 also are available except that Atlas is replaced by SLV3X.

And yet our Journal pages—intended as the leading edge of the aerospace field—do not yet reflect it; there are few papers dealing with the interaction of the solar wind with magnetic fields, the questions of atmospheric structure and circulation, the concepts of experimental relativity and gravitation, planetary cratering and impact phenomena, the turbulence of stars, and the magnetohydrodynamics of the sun!

Do we abandon the familiar great unsolved problems, turbulence, the three-body problem, the problems of atmospheric flight? Of course not! Many merely appear in a different frame of reference and in a different scale.

But we are finally entering space—comfortably. It is time to reap, to explore, and to use!

To Discharge a Debt . . .

It is again a duty and a pleasure to recognize the quiet contributions of our referees and our associate editors. We have noted before that this is a vital ingredient of professional activity, a dialogue of constructive criticism and detailed comment which assures the community of control of

quality and the author of recognition by his colleagues and peers.

And yet it is more than that; the process of self-criticism implicit in archive technical literature helps assure society at large that the science and technology it supports is indeed valid and deserving of support.

We wish to express our deep appreciation to our retiring associates, Arthur Bryson, Robert Jahn, and Eraldus Scala;

may they prosper, regain their families and friends, and write good reviews.

Finally, may we share with the authors the intellectual stimulation and pleasure we derive from our role in contributing to the exposure of their creative ideas.

Leo Steg
Editor-in-Chief

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