fervently critical of them. I appreciate the former and will make brief comments relative to the latter.

At the present time, the United States has several billion dollars worth of unmanned, high-priority spacecraft in its launching queue, and the queue grows longer month by month. The list includes a comprehensive mix of spacecraft for commercial, applicational, scientific, and military purposes.

The true national urgency is to reestablish a diverse and resilient launching capability as quickly as possible. Because of massive and complex safety considerations (of which the well-known O-ring problem is only the tip of the iceberg) in requalifying the shuttle for the flight of human crews, we can best do this by returning to primary dependence on combinations of expendable launch vehicles.

There is no comparable urgency to resuming manned shuttle flights, and there is even less urgency to developing a large space station. One may recall that no U.S. manned flights were conducted for nearly 6 years—July 1975 to April 1981—yet this period was one of the most fruitful in the history of space exploration and exploitation.

For the more distant future, we can derive guidance from the recent report of the National Commission on Space (*2*) and its many kindred antecedents (*3*) and from the forthcoming report of the National Academy of Sciences (*4*).

But I find it extremely difficult, if not impossible, to foresee any substantial real growth in the federal budget for civilian space purposes during the next decade of prospective fiscal restraint.

Meanwhile, our dedication must be to use the best means at our disposal, limited though they will be, to ensure that our national space effort produces the maximum possible yield of truly significant results.

That is my point.

JAMES A. VAN ALLEN
Department of Physics and Astronomy, University of Iowa, Iowa City, IA 52242

REFERENCES AND NOTES

1. My Perspective was essentially a condensation of a lecture that I gave at a Coe College convocation on 1 November 1982 and later elsewhere. I invite the reader's attention to my article, "Space science, space technology and the space station" [*Sci. Am.* **254**, 32 (January 1986)], which was written in the autumn of 1985 and contains a fuller development of my views.
2. *Pioneering the Space Frontier, The Report of the National Commission on Space* (Bantam, New York, 1986).
3. W. Ley and C. Bonestell, *The Conquest of Space* (Viking, New York, 1951); W. von Braun, *The Mars Project* (Univ. of Illinois Press, Urbana, IL, 1953) (Translation of *Das Marsprojekt*, 1951); *Colliers* **129**, 22 (22 March 1952); W. von Braun, *ibid.*, p. 24; W. Ley, *ibid.*, p. 30; F. L. Whipple, *ibid.*, p. 32; J. Kaplan, *ibid.*, p. 34; H. Haber, *ibid.*, p. 35; O. Schacter, *ibid.*, p. 36; F. L. Whipple and W. von Braun, *ibid.* **130**, 38 (25 October 1952); W. Ley, *ibid.*, p. 46; F. L. Whipple, *ibid.* **133**, 21 (30 April 1954); W. von Braun and C. Ryan, *ibid.*, p. 22; S. B. Kramer and R. A. Byers, *Proposal for the Assembly of a Multi-Manned Satellite* (LMSD-48347, Lockheed Missile Systems Division, Sunnyvale, CA, 18 December 1958); *The Challenges of Space*, H. Odishaw, Ed. (Univ. of Chicago Press, Chicago, IL, 1962); *The Post-Apollo Space Program: Directions for the Future, Space Task Group Report to the President* (Government Printing Office, Washington, DC, 1969).
4. Space Science Board, *Major Directions for the Space Sciences: 1995–2015* (National Academy Press, Washington, DC, in press).

Erratum: A number was inadvertently omitted from the News and Comment article "Pentagon plans new antisatellite tests" by R. Jeffrey Smith (25 July, p. 409). In a discussion on page 410 about potential Soviet evasion tactics (second column, second paragraph), the numeral 2 was omitted from the following sentence: "The problem stems in large measure from the fact that target coordinates for the weapons must be supplied more than 2 hours before an attack."

Erratum: The Voyager 2 spacecraft is powered by radioisotope thermoelectric generators. A decrease in output by this power source, not solar batteries (This Week in Science, 4 July, p. 7), may at some future time bring an end to the effective operation of the Voyager 2 spacecraft.