Editorial & Letters

EDITORIAL

Space Policy in a Vacuum

There is a saying in the building trades that a problem in the foundation chases you all the way to the roof. The U.S. space program faces a similar foundation problem. The heart of the matter is a policy failure—our political leadership has not succeeded in building a sustainable consensus regarding our national purposes in space. The consequences of this policy failure are manifest in the recently announced cost overruns on the International Space Station and in the recent near-miss accidents on the Russian spacecraft *Mir*.

Take the cost overruns in the Space Station, for example. Such overruns have become pervasive, and NASA's record in meeting cost and schedule goals is among the poorest of federal agencies. NASA has attempted to cope with the overruns through efficiency improvements such as procurement reform and streamlined management. These efforts are highly commendable— but not enough. The space agency is simply trying to do too many things with the available resources. A sharper focus is needed, and this requires clear choices of what the space program will and will not undertake. But without political leadership and consensus building from the President and Congress, the space agency has no basis for making these choices.

These purposes need not be of the compelling urgency motivated by the Cold War. Indeed, response to such an urgency can lead to shortsighted policy. Once the lunar landing was achieved, space budgets were cut, and from the time the Apollo missions ended in 1975, U.S. astronauts would not fly in space for another 6 years. Large-scale technology programs do not work well in such fits and starts. Engineering teams dissolve, managerial skills are lost, and once-familiar technology passes from our grasp. Thus, the essence of effective space policy is sustainability—and sustainability requires an enduring political consensus.

The concern about the lack of a federal space policy has been widely and long noted. In 1988 a National Academy of Sciences and National Academy of Engineering report* and in 1994 a Congressional Budget Office study† emphasized this point. Both reports suggested that the public debate leading to such a consensus can be framed according to three alternatives.

The first would emphasize space science. An enhanced program of scientific exploration would rely mainly on advanced robots rather than on human space flight. Scientific observations of Earth would be of special value in understanding the global climate. The Space Station, which is unsuited for much space science, would probably not be built.

The second alternative would eschew robots except as enhancements to human presence in space. It would emphasize manned spacecraft with the goal of increasing the skill and efficiency of human space operations. The Space Station would become the central platform for achieving these capabilities. Further human missions to the moon and perhaps the planets would be contemplated, most likely as a multinational enterprise.

The third alternative would emphasize both the use of advanced robots and human space flight. This alternative is sufficiently costly that it would require a multinational effort in which funding is shared equitably by the participants. Crafting a durable and effective international space program will not be easy, as the largely unsuccessful European efforts of the 1960s demonstrated. Indeed, it will require of the Clinton administration a degree of interest in and commitment to space policy that it has yet to demonstrate.

The public must decide which alternative it wants. The science and engineering communities can and should advise, but they cannot decide. What is needed is an effective political process that connects what is technically achievable with widely shared national values and purposes. To begin, the President should marshal his science advisory apparatus and, with the best counsel available, develop a sustainable vision and the policies to implement it.

Of course, this vision will be hotly debated within Congress and even internationally. The process will be untidy and slow, but this is the price paid for policies founded on political consensus. Above all, the process must be engaged now, before someone's luck runs out on *Mir* and before additional billions are spent on projects of uncertain value.

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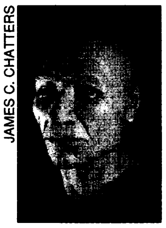
* *Committee on Space Policy, National Academy of Sciences–National Academy of Engineering, "Toward a New Era in Space: Realigning Policies to New Realities," National Academy Press, Washington, D.C., 1988.*
† *D. Moore, "Reinventing NASA," Congressional Budget Office, Congress of the United States, March, 1994.*

LETTERS

Ages of man


JAMES C. CHATTERS

An earlier radiocarbon date for Kennewick Man (left) is presented. The place of scientific data with an unpredictable lifetime on the World Wide Web is discussed. Priority in the field of auditory cortex plasticity is debated. And the topic of infants' memory for the spoken word is explored.

Radiocarbon Dates of Kennewick Man

The News & Comment article "Kennewick Man's trials continue" by Virginia Morell (10 Apr., p. 190) reports the continuing legal and administrative conflicts over attempts by anthropologists and others to regain the ability to sample the Kennewick and other early North American skeletons to complete appropriate analytical studies, including morphological and DNA analyses. As also noted in earlier News & Comment articles (V. Morell, 2 Jan., p. 25; A. Gibbons, 11 July 1997, p. 173), data obtained to date on these skeletons have raised the possibility that some of the earliest American human populations have no modern descendants in the New World. The new data suggest that a very complex set of relationships may have existed among Paleoamerican and Paleoindian human populations during the terminal Pleistocene and early Holocene in North America. The nature of these relationships can be explored and various inferences confirmed or discarded only by a series of carefully designed studies on well-documented New World human skeletal samples.

An age of 9300 years has been associated with the Kennewick skeleton on the basis of a carbon-14 (^{14}C) age determination. In light of the wide dissemination of this value, we think it would be helpful to provide a more complete statement of the results of the initial ^{14}C measurement on this sample.

A portion of the fifth metacarpal bone of the Kennewick skeleton was provided to the Radiocarbon Laboratory at the University of California, Riverside (UCR). The amino acid profile of this sample indicated a collagen-like pattern similar to that which is typically obtained from a modern bone. Because of the good collagen preservation in the bone, a total amino acid fraction was prepared by