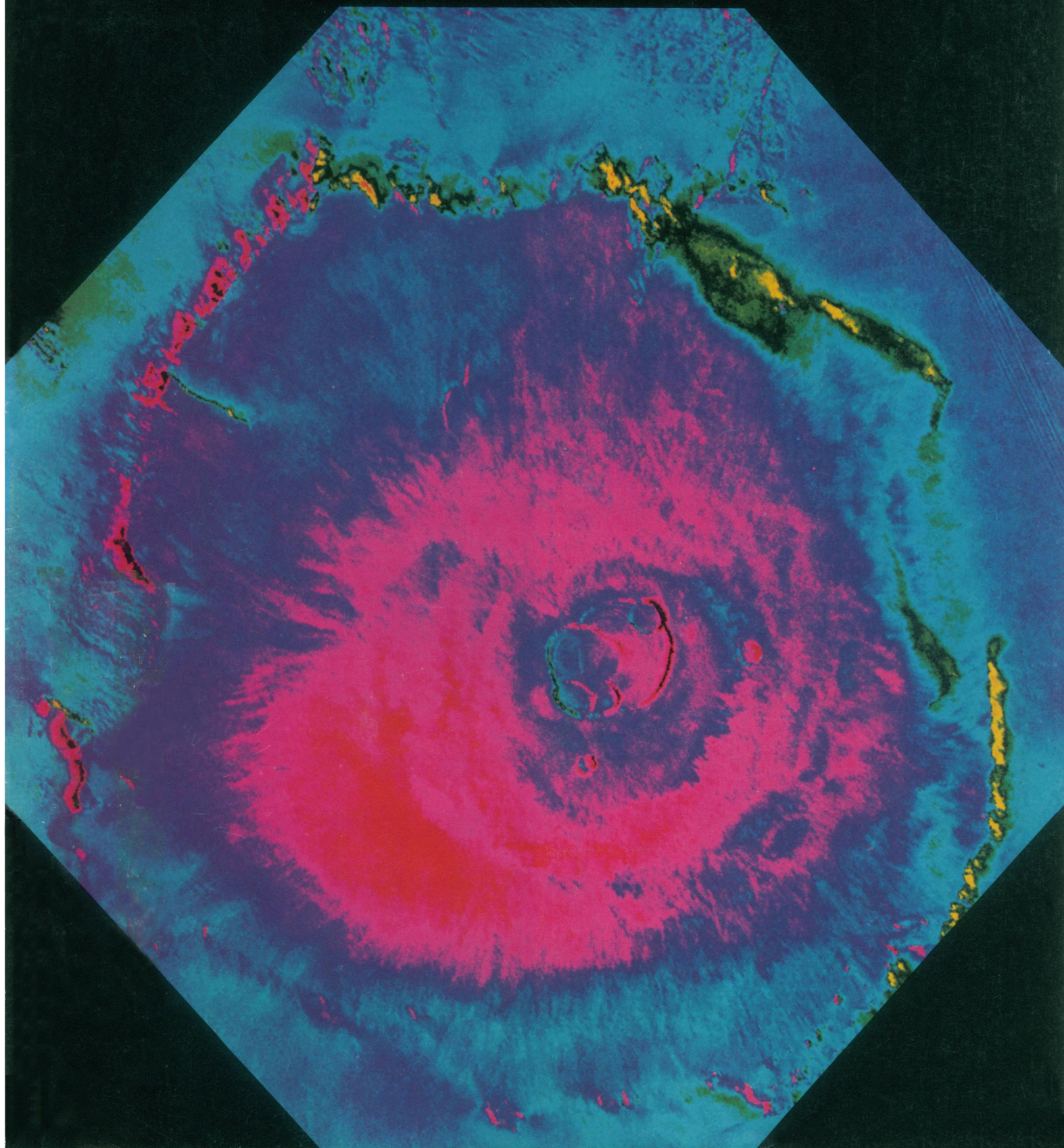


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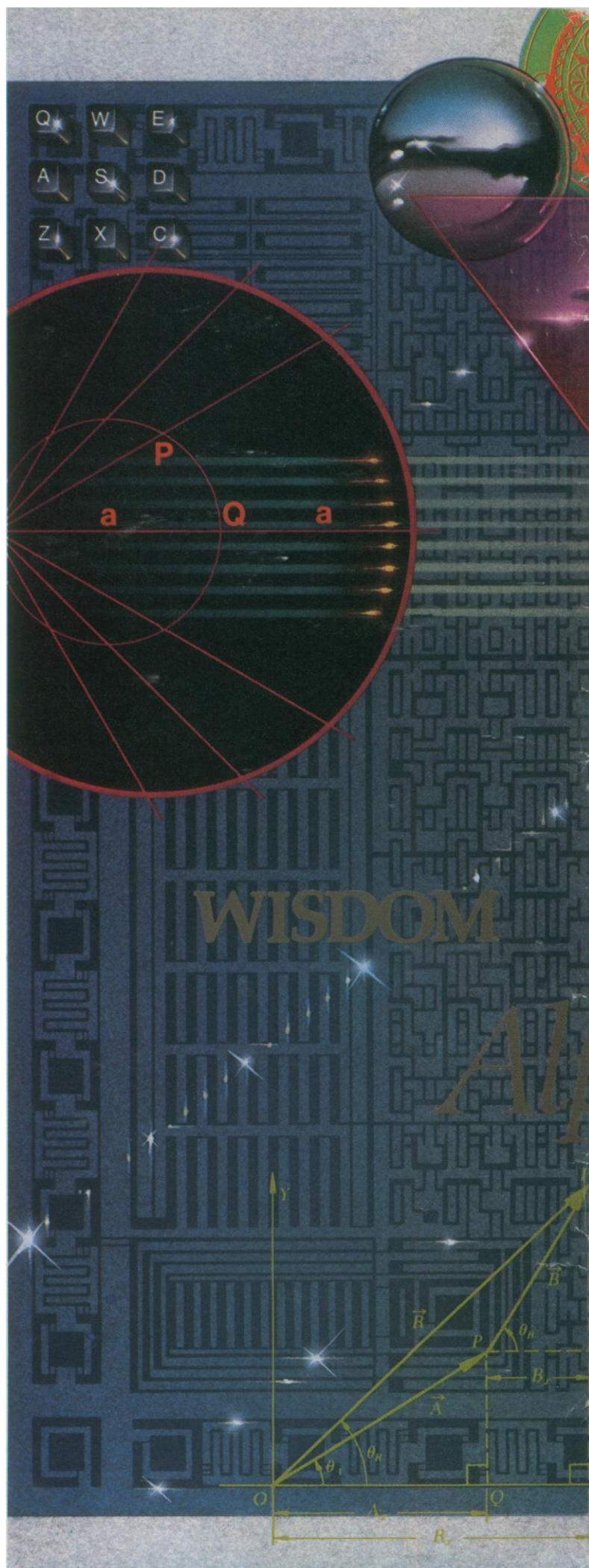
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COVER

Mars' extinct volcano, Olympus Mons, was photographed by Viking Voyager 1. It is shown in false color which exaggerates very subtle differences in the volcano's lava flows that have accumulated over time. Olympus Mons is the largest known volcano in the solar system, rising 26,400 meters above Mars' average elevation. See page 561. [U.S. Geological Survey/NASA, Flagstaff, Arizona]

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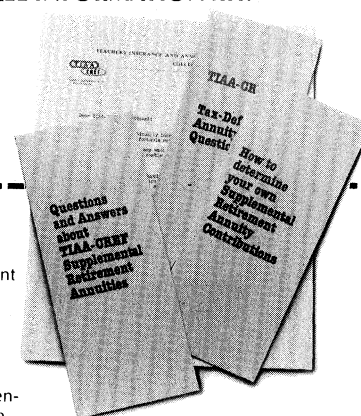
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Pendery *et al.*, was unprecedented in my experience of more than 20 years as editor.

The Sobells, in writing, threatened us with legal action while we were in the initial phase of considering the paper. Shortly after, we received a letter from their attorney. Under such circumstances, prudence dictates that contact between the principals cease and that one deal with the matter through attorneys.

The report that we published in our 9 July issue was very carefully edited. It was extensively reviewed, including evaluation by an expert statistician. Painstaking efforts were made to ensure an absence of comment about the integrity of the Sobells. We required that assertions made about patients' histories be documented by court records, police records, hospital records, or affidavits. The final draft was checked repeatedly, sentence by sentence, to ensure that supporting evidence was available. In crucial instances, two or more independent documents corroborated statements made.

For years the Sobell paper of 1972 went virtually unchallenged. Their work received a large play in the media. Attempts by Mary Pendery to examine the basic data and to follow up on patients' subsequent histories were impeded by repeated legal action by the Sobells. The avenue of a technical comment has been and remains open to the Sobells. They have not so far availed themselves of it.—PHILIP H. ABELSON

Millisecond Pulsar

In M. Mitchell Waldrop's excellent article about the Millisecond Pulsar (*Research News*, 18 Feb., p. 831), there are two minor errors. First, the spectrum of 4C21.53 falls rapidly with frequency, as does the spectrum of pulsars. Second, while the ratio of period (P) to period derivative ($\dot{P}$) gives a time scale of billions of years, I do not think that its age is much greater than 10^6 years. The pulsar is very near the galactic plane. Since most pulsars move at 100 kilometers per second, this indicates an age near 10^6 years. Also, the original period was probably not much less than $P_0 \sim 1.5$ milliseconds; if so, the age is not $P/\dot{P}$, but $P/2\dot{P} \times (1 - (P_0/P)^2)$.

D. C. BACKER

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Nuclear Power in Space

While we do not dispute any statements of fact in William J. Broad's short article "Fallout from nuclear power in space" (*News and Comment*, 7 Jan., p. 38), we believe that an unnecessarily frightening impression may have been received by *Science* readers. For example, Broad's conclusion that "The contamination was not unprecedented but it was quite large"—referring to the plutonium-238 from the reentered and burned SNAP-9A power supply—does not follow from data presented in table 3 of the paper to which he refers (*1*). The global plutonium deposited by 1970 was made up of ^{239}Pu and ^{240}Pu (325 ± 36 kilocuries), ^{238}Pu from weapons (7.7 ± 0.9 kilocuries), and ^{238}Pu from SNAP-9A (13.9 ± 2.2 kilocuries). The other two alpha-emitting isotopes (masses 236 and 242) were virtually too low in concentration to be measured.

Indeed, the total ^{238}Pu on the ground before the SNAP-9A incident was a little more than 2 percent of the total plutonium, and the "... threefold increase of plutonium-238 contamination ..." mentioned at the end of Broad's fourth paragraph increased the fraction to 4 percent. In this context it does not seem reasonable to refer to the additional plutonium as "large," nor does questioning the possible health effects of the accident appear practical in light of the small overall risk attributed to the total environmental ^{238}Pu (*2*).

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References

1. E. P. Hardy, P. W. Krey, H. L. Volchok, *Nature (London)* **241**, 444 (1973).
2. United Nations Scientific Committee on the Effects of Atomic Radiation, *Ionizing Radiation: Sources and Biological Effects. UNSCEAR 1982 Report to the General Assembly* (United Nations, New York, 1982).

Erratum: In the report "Eruption of El Chichón volcano, Chiapas, Mexico, 28 March to 7 April 1982" by J. M. Hoffer *et al.* (24 Dec., p. 1307), the millimeter readings in figure 2 (p. 1308) were in error by a magnitude of one; the 100, 200, 300, 400, and 500 mm contours should have been 10, 20, 30, 40, and 50 mm.

Erratum: The report "Topography, albedo-temperature feedback, and climate sensitivity" by G. E. Birchfield and J. Wertman (21 Jan., p. 284) should have included the following acknowledgment as note 11: "This work was partially supported by grant 8111138 from the Climate Dynamics Section of the National Science Foundation."

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Maintaining Scientific Primacy

The eagerness of both parties to increase support for scientific research* has, for the scientific community, an element of déjà vu. The increased funding is highly welcome, as a needed corrective to chronic underfunding in several areas and recent budgetary damage to others. But, if such support is not to prove evanescent, the scientific community must be articulate about the dynamics driving the need for funding increases. One such dynamic is the cost of national primacy in science: the ever-rising expense of maintaining a frontier position in scientific research and of advancing at the margins. Instrumentation, the level of training, and computational demands all scale upward in cost and complexity as research becomes more demanding. Many of the concerns in this country related to the health of science—its support and its institutions—stem from the pressures of being at the scientific frontier, at the top of a very slippery climb.

Other countries are now climbing that slope. Japan and France, for example, have both acknowledged a limit to dependence on derivative science for their future technological capacities. They and other nations are already contesting our primacy in various fields of scientific research, and even more will do so. We ought to welcome the competition, for as long as we see to our own house we will gain greatly from the scientific advances of other nations.

Such an argument is seemingly contradicted by the current, and proper, concern with U.S. capacities in global technological competition. However, while basic research is a component of technological competition in global markets, it is not the most critical element. Moreover, the scientific endeavor should transcend the momentary frictions of such competition. It is—or should be—a global binding agent, uniting all cultures in the common quest to understand nature and to improve the human condition.

If the United States (or any nation, for that matter) is to gain from intensified scientific competition, the essential requirements are open communication of science and the resolve to incur the costs of maintaining general excellence in basic research. Regarding open communication, the Matthew principle applies: those that have the most to give have the most to gain. The strength of American science ensures our capability to benefit from progress in any field elsewhere.

The budget now going through Congress will be a major factor in retaining scientific strength and, therefore, in gaining from the advances of other nations. But beyond the program increases—essential to enriching the substance of science—we need to examine the institutions of science. For example, public and private research universities—the "home of science" in the United States—are, with the rest of the economy, suffering from financial pressures. Overall, the patterns of state, federal, and private support continue to be volatile, the embedded costs of graduate education are rising, and some of the usual subsidies for graduate education may no longer be available.

Other elements underpin our leadership in world science, such as the health of American education. There now is a national awakening to our potentially disastrous weaknesses in science and mathematics education. A number of bills are in Congress, and the budget for fiscal year 1984 contains new initiatives in science education. In the past, the nation's concern with education was fleeting. We need to emplace enduring programs.

The United States will face difficulties in staying at the frontiers of science. But if we maintain the excellence of our research, we stand to gain a great deal from the first-class research of other nations. Required of us is a commitment to keep our research institutions strong, to ensure stability in funding basic research, and to insist on open communication of science among all nations.—FRANK PRESS, *President, National Academy of Sciences, Washington, D.C. 20418*

*C. Norman, *Science*, 8 April, p. 174.

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