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Response: Hastenrath is right in pointing out that factors other than air temperature affect the mass balance of glaciers. First of all, solar radiation forms the most important source of energy for the melting process on most glaciers. This implies that changes in cloudiness are potentially important. Latent heat transfer, related to humidity, is another factor. Also, changes in precipitation can greatly change a glacier's mass budget.

My view—that, on the global scale, air temperature is the most important factor—is based on calculations with a mass balance model (*1*). For a typical midlatitude valley glacier, a 40% decrease in cloudiness or a 20% decrease in precipitation would have the same effect as a 1°C temperature rise. Such changes in cloudiness or precipitation may occur locally or even regionally on a decadal time scale, but most climatologists would agree that global trends of this order on a century time scale are unlikely. This justifies the statement that the observed retreat of valley glaciers is first of all a result of rising air temperature.

The mass balance of tropical glaciers has different characteristics. There is no well-defined melting season and changes in precipitation are probably larger than anywhere else, implying that the climatic interpretation should be done with great caution. I agree with Hastenrath that the record of Lewis glacier is unique and should be continued by all means.

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UNESCO's Role

I support the ideas expressed in the Policy Forum "Back to the future with UNESCO" by Rita R. Colwell and David Pramer (19 Aug., p. 1047). Among the many activities of UNESCO, where it is unique as a worldwide organization, is its role in the bridge between science and culture, as reflected by the encouragement of fundamental science on a worldwide scale.

I have sought the assistance of UNESCO on a project to construct large detectors covering 5000 square kilometers to study the highest energy cosmic rays (energies $\geq 10^{20}$ electron volts, ≥ 16 joules) with the strong support of its director general, Federico Mayor. UNESCO is currently helping us with the formation of an international group that will meet at Fermilab (in Batavia, Illinois) in early 1995 to make a technical design for such a detector.

It is clear that, in the future, large and expensive science projects will require international collaborations. Their success will depend on international participation in the design stage of the project. In the formation of such collaborations, there is an opportunity to seek the intellectual contributions from developing countries or from countries emerging from the cold war era. UNESCO is the ideal organization to aid in finding such qualified scientists and engineers. After the technical design, UNESCO can be of great assistance in bringing scientific representatives of countries together to form the worldwide collaboration that will construct the apparatus which has been designed by the international group.

Such a role for UNESCO is nothing new. In the early 1950s, UNESCO was instrumental in the foundation of CERN (the European Organization for Nuclear Research) with the leadership of I. I. Rabi and Piérre Auger. As Colwell and Pramer suggest, the United States should rejoin UNESCO. Several years ago I signed a petition to that effect. I can state in a most concrete way that UNESCO has been, and will continue to be, an effective catalyst for our efforts to study the highest-energy cosmic rays.

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Strategies for Research

"Reorientation of research objectives" is currently much discussed, as in an editorial of that title by Philip H. Abelson (6 May, p. 755). The editorial cites opinions from a representative of the Council on Competitiveness and from a recent official of IBM, but the questions involved are more extensive than these opinions suggest.

On the one hand, there are now insistent calls from the U.S. Congress for attention to strategic research, often following specified initiatives chosen by government officials. This has meant that scientific projects that fit these initiatives are often well funded, but it is not clear that the selected initiatives take enough account of the actual prospects of science. What might result? Well-funded initiatives chosen by officials may tempt some scientists to disguise their work so that it fits under popular rubrics. When strategic initiatives are funded more heavily than individually initiated research, the country is likely to lose the benefits of the ideas and imagination of those individual scientists who are in a position to discover important, novel directions.

Recently there has been much agitation about the loss of competitiveness. The causes are not clear, but decisions made by industry have been involved. Industrial research laboratories have been cut back or eliminated, the cost of capital has been high, and there is insistent attention to the bottom line. This has meant that industry has often not cultivated the long-range prospects raised by scientific research. Under these conditions it is not evident why one should seek advice from industry about the reorientation of research—in particular, advice from a representative of IBM, a firm not noted for recent success. The "competitiveness" slogan has partisan overtones, especially as represented by the (private) Council on Competitiveness. Again I wonder why representatives of that council should be the ones to offer advice.

The problems of research objectives are difficult. We need disinterested advice that is well informed about current science. World leadership in basic research is not just a question of competitive advantage; it is a question of the understanding of the world.

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Handedness: Basic Physics

The revelation that the asymmetric synthesis of chiral molecules reported by researchers at the University of Bonn was in fact fraudulent (D. Clery and D. Bradley, News & Comment, 1 July, p. 21) should hardly have come as a shock. It is a matter of basic physics, unmentioned in Clery and Bradley's article, that static magnetic fields alone cannot ever be responsible for asymmetric synthesis.

Static magnetic fields, like electric fields, have no intrinsic chirality or "handedness." For example, a closed circular loop of current-carrying wire generates a magnetic field, but clearly is neither right- nor left-handed; it cannot interact differently with the two enantiomers of a chiral molecule. Our quirky right-hand rule for assigning direction to its magnetic field does not change this fact. Only when we also define a preferred spatial direction or impose other new vectors or fields can that system exhibit a particular handedness. Even then, it is a subtle matter to determine whether such combinations of fields can really have a chiral influence on a chemical reaction (*1*).

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Corrections and Clarifications

In the News & Comment article "Genetic testing set for takeoff" by Rachel Nowak (22 July, p. 464), Michael Liskay of Oregon Health Sciences University in Portland should have been named as the senior scientist on one of the teams that identified *MLH1*. The test for Charcot-Marie-Tooth disease detects the duplication of the *PMP22* gene, not a deletion, as stated in the table accompanying the article (p. 466).