CONTACT *SCIENCE*

Letters to the Editor
May be submitted via e-mail (at science_letters @aaas.org), fax (202-789-4669), or regular mail (*Science*, 1200 New York Avenue, NW, Washington, DC 20005, USA). Letters are not routinely acknowledged. Full addresses, signatures, and daytime phone numbers should be included. Letters should be brief (300 words or less) and may be edited for clarity or space. They may appear in print and/or on the Internet. Letter writers are not consulted before publication.

Subscription Services
For change of address, missing issues, new orders and renewals, and payment questions, please contact AAAS at Danbury, CT: 800-731-4939 or Washington, DC: 202-326-6417, FAX 202-842-1065. Mailing addresses: AAAS, P.O. Box 1811, Danbury, CT 06813 or AAAS Member Services, 1200 New York Avenue, NW, Washington, DC 20005 • Other AAAS Programs: 202-326-6400

Member Benefit Contacts
For Credit Card: MBNA 1-800-847-7378; Car Rentals: Hertz 1-800-654-2200 CDP#343457, Dollar 1-800-800-4000 #AA1115; AAAS Travels: Betchart Expeditions 1-800-252-4910; Life Insurance: Seabury & Smith 1-800-424-9883; Other Benefits: AAAS Member Services 1-202-326-6417.

Reprints
Ordering/Billing/Status 800-407-9190; **Corrections** 202-326-6501 **Permissions** 202-326-7074, FAX 202-682-0816

Internet Addresses
science_editors@aaas.org (for general editorial queries); science_news@aaas.org (for news queries); science_letters@aaas.org (for letters to the editor); science_reviews@aaas.org (for returning manuscript reviews); science_bookrevs@aaas.org (for book review queries); science@science-int.co.uk (for the Europe Office); membership@aaas.org (for member services); science_classifieds@aaas.org (for submitting classified advertisements); science_advertising@aaas.org (for product advertising)

Information for Contributors
See pages 99 and 100 of the 1 January 1999 issue or access www.sciencemag.org/misc/con-info.shtml

Editorial & News Contacts
North America 1200 New York Avenue, NW, Washington, DC 20005 Editorial: 202-326-6501, FAX 202-289-7562 News: 202-326-6500, FAX 202-371-9227 • Bureaus: Berkeley, CA: 510-841-1154, FAX 510-841-6339, San Diego, CA: 760-942-3252, FAX 760-942-4979, Chicago, IL: 312-360-1227, FAX 312-360-0537
Europe Headquarters: Bateman House, 82-88 Hills Road, Cambridge, UK CB2 1LQ; (44) 1223-326500, FAX (44) 1223-326501 Paris Correspondent: (33) 1-49-29-09-01, FAX (33) 1-49-29-09-00
Asia News Bureau: Dennis Normile, (81) 3-3335-9925, FAX (81) 3-3335-4898; dnormile@twics.com • Japan Office: Asca Corporation, Eiko Ishioka, Fusako Tamura, 1-8-13, Hirano-cho, Chuo-ku, Osaka-shi, Osaka, 541 Japan; (81) 6-202-6272, FAX (81) 6-202-6271; asca@os.gulf.or.jp • China Office: Hao Xin, (86) 10-6255-9478; science@public3.bta.net.cn • India correspondent: Pallava Bagla, (91) 11-271-2896; pbagla@ndb.vsnl.net.in

On the Frontiers of Science

Michel Cuénod

The Human Frontier Science Program (HFSP) was established on the principle that cooperation among scientists in different countries is more fruitful than competition among them. HFSP promotes worldwide, interdisciplinary, basic research networks in molecular and cell biology and in neuroscience. The celebration of its 10th anniversary with events in Tokyo; Strasbourg, France; and Washington, DC, provides an opportune time to gauge how successful HFSP has been in achieving its goals.

In 1987, Prime Minister Yasuhiro Nakasone of Japan proposed the creation of HFSP at the G7 economic summit and announced that his government would cover a large part of the starting expenses. The other G7 members, soon joined by the European Union and Switzerland, enthusiastically approved this proposal. The program was founded in 1989. It is governed by a board of trustees, chaired initially by Ambassador Hiromichi Miyazaki and currently by Kozo Iizuka (Japan), and by a council of scientists, which has been chaired by Joseph Rall (United States), Klaus-Peter Hoffmann (Germany), Pierre Chambon (France), and Albert Aguayo (Canada). At the secretariat in Strasbourg, the first secretary general, Sir James Gowans (United Kingdom), and colleagues from the National Institutes of Health established an exemplary selection procedure based on international peer review.

Papers resulting from international collaboration are quoted more frequently.

HFSP has distributed US$363 million over 10 years in research grants, fellowships, and support for workshops. Although not among the larger funders of scientific research, HFSP is set apart from other funding agencies by its overriding commitment to international collaboration. The bulk of HFSP's funding goes to a research grant program that is unique in the life sciences in its support of multinational teams that allow cooperation at conceptual, methodological, and technical levels between younger and more senior researchers throughout the world. It is often difficult to find an outstanding colleague in one's own country who has both specific expertise in and a mutual interest in a research topic; HFSP allows the search for collaborators to be extended to scientists throughout the world. The importance of such international collaborations has been demonstrated in a preliminary bibliometric analysis of citations in the fields covered by HFSP: Papers resulting from international collaboration are quoted on average two to three times more frequently than are publications with authors from a single country.

Fellowships sponsored by HFSP allow talented young scientists to obtain postdoctoral training in top laboratories abroad, and the workshops enable an international and multidisciplinary group of 20 outstanding scientists to intensively discuss topics at the frontiers of research. The workshop proceedings are made available to the scientific community as a book series (see www.hfsp.org).

The HFSP programs are highly competitive: Only 12% of grant applications and 18% of long-term fellowship applications are funded. The budgetary constraints also necessitate a restrictive policy on extension of grants; the limited funds are used instead to encourage new projects. However, the program continues to attract scientists of a very high caliber; indeed, in the past 3 years, five HFSP grantees have subsequently been awarded Nobel Prizes in physiology or medicine, in chemistry, and in physics.

Two years ago, two independent reviews of the program were published. Both emphasized the excellence and uniqueness of HFSP and recommended the expansion of its activities through an increase in the budget.

Despite the international success of the program, Japan still provides 77% of the budget (which totaled US$47 million in 1998); North America and Europe contribute the other 23%. In May 1997, an intergovernmental conference was held at the White House at the invitation of Jack Gibbons, science adviser to the president at the time. All parties agreed to maintain the program and to improve its financial support, aiming toward parity between Japan and the West. If this goal is achieved, HFSP would have a brilliant future and could continue to be a model for other scientific collaborations.

The author is secretary general of the Human Frontier Science Program.