LETTERS

Foundations

A researcher recommends "equal intellectual contributions" in joint Chinese-Western research projects. Italian scientists write in favor of "bringing Italian science into Europe." A lack of appropriate funding is said to cause "much uncertainty" for Argentinian scientists. The possibility is raised that burning rain forests in Brazil can lead to respiratory and mosquito-borne disease. And are objects found in meteorites and in rocks on Earth smaller than "the lower limit for metabolically active life"? [Right, "bean-shaped nannobacteria" on a mineral; scale bar, 1 micrometer; from R. H. Sillitoe *et al.*, *Science* **272**, 1153 (1996)].

Successful Collaboration

As a frequent participant in collaborative research projects in China, I read "Geoscientists seek common ground on collaborations" (News & Comment, 2 May, p. 673) with great interest. In many international collaborative projects in China, it is not uncommon that the Chinese scientists end up supplying raw materials (samples and specimens) to their foreign collaborators, who analyze, interpret, and in many cases, write up the results for English publications. Such an imbalance of intellectual input in a joint project is hardly a good way for Chinese colleagues to earn respect.

Instead of asking for increased financial incentives and grumbling about lack of respect, our Chinese colleagues should call for equal opportunity and full participation throughout the entire course of the collaboration. After all, equal intellectual contribution to a joint research project is essential to earn mutual respect and is the very foundation for a successful international collaboration.

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Italian Basic and Applied Research

We congratulate Lucio Bianco on his appointment as the new president of the Italian National Research Council (CNR) (S. Biggin, News & Comment, 28 Mar., p. 1871). This appointment was made by Luigi Berlinguer as part of a radical plan to shift CNR research from basic to applied. The possibility is also being discussed that research will be moved out of the CNR centers (mainly located within universities) to the CNR institutes, which are independent bodies.

This is not the first time that we have heard such discussions. More than 100 years ago, Louis Pasteur taught scientists that there is no clear distinction between basic, theoretical, and applied science. Rather, one can distinguish between good and bad science. Many examples can be provided of "basic" research that has become "applied" within a few years, particularly in the fields of biomedicine and biotechnology.

We would welcome a different move from Berlinguer: that of bringing Italian science into Europe, exactly as the prime minister and the finance minister of the same government are trying to bring Italy into accordance with the Maastricht economic standards.

- It is time that good Italian science is distinguished from bad Italian science, just as it is in the rest of Europe.
- It is time that real peer review is established.
- It is time that panels of expert international reviewers make site visits to our CNR centers and institutes. Our European colleagues are ready to collaborate with Italians in such a process.
- It is time that human and financial resources are given only to groups with good records and good projects. Afterwards, a policy of allocation of money and resources can be made.

■ It is time to lift the blocking of turnover, in force for the past 10 years at the majority of CNR centers.

■ It is time that the CNR resumes its fundamental and institutional role of programming the future of Italian scientific research. Such a role cannot be fulfilled if the CNR cuts its productive interaction with Italian universities, where most of Italian research is still performed.

We have circulated this letter among colleagues involved in research in the biomedical field and have found that there is widespread agreement on the main points we raise.

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Smoky Skies, Mosquitoes, and Disease

The report "Direct radiative forcing by smoke from biomass burning" by Peter V. Hobbs *et al.* (21 Mar., p. 1776) discusses the regional nature of a massive aerosol source in Brazil and suggests a possible effect on global climate. A more immediate concern is respiratory disease associated with particulate inhalation (*1*). Additional concerns are regional scale reductions in photosynthesis and the possibility of increased incidence of infectious and mosquito-transmitted disease.

In regions of intensive biomass burning in the tropics, the Amazon in particular, the photosynthetically active spectrum of sunlight (wavelengths of 400 to 700 nanometers) is reduced approximately 35 to 40% for 2 months (*2*). Ultraviolet-B (UV-B) in natural sunlight kills airborne bacteria (*3*), and exposing drinking water to normal intensities of UV-B has reduced diarrhea in children in Kenya by 33% (*4*). Thus, the sharply diminished (by more than 80%) UV-B during the burning season in Brazil (*5*) might enhance the populations of infectious pathogens suspended in air and water.

There is an increasing incidence of yellow fever in Brazil, Bolivia, and sub-Sahara Africa (*6*). The larvae and pupae of some disease-transmitting mosquitoes (including *Aedes aegypti*, an important vector for yellow fever and dengue fever, and *Culex pipiens*, which can transmit encephalitis) are highly photophobic to the UV-A and green wavelengths of sunlight. During the 1995 burning season in Brazil, regional smoke reduced sunlight in the UV-A (340 nanometer wavelength) range as much as 74% and in the green (500-nanometer wavelength) range as much as 45% near Cuiabá, far from the region of maximum burning (*5*). Experiments with wild populations of *C. pipiens* show that, when given a choice of nursery sites with eight gradations of natural illumination, females deposit their eggs in the darkest nurseries (*7*), and their larvae avoid UV (*8*).

The possibility that severe aerosol loading in the tropics can cause respiratory disease, suppress photosynthesis, increase the number of darkened mosquito nurseries, and enhance the survival of pathogenic microorganisms suspended in air and water warrants investigation. Such investigation

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