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Smoky Skies, Mosquitoes, and Disease

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■ 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

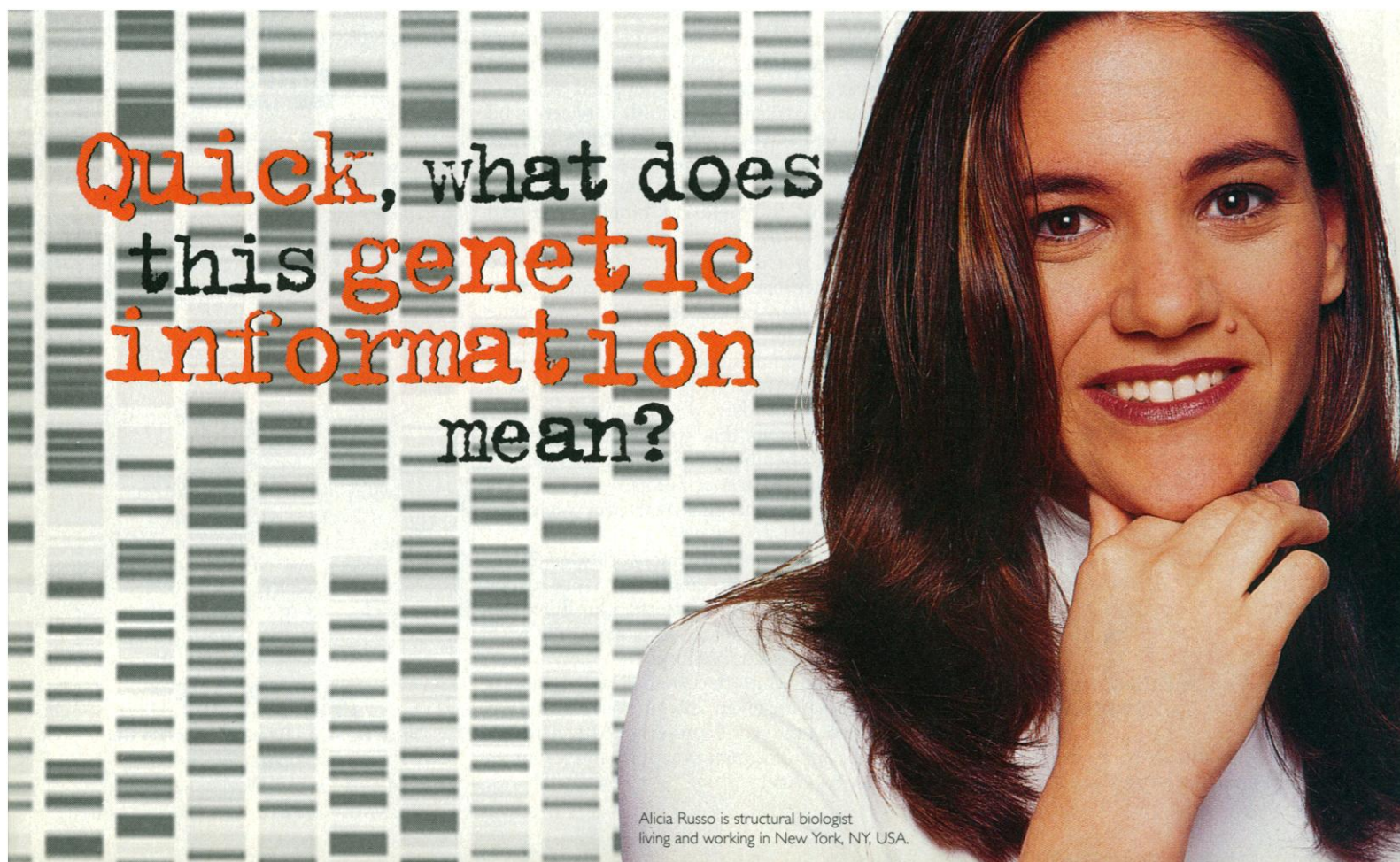
The report "Direct radiative forcing by smoke from biomass burning" by Peter V. Hobbs *et al.* (21 Mar., p. 1776) discusses the regional nature of a massive aerosol source in Brazil and suggests a possible effect on global climate. A more immediate concern is respiratory disease associated with particulate 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-Saharan 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



might also shed light on other biological effects of severe aerosol loading.

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Science Funding in Argentina

In Argentina, the National Council for Scientific and Technical Research (CONICET) is responsible, together with the universities, for most of the research conducted in different areas of knowledge. A critical problem faced by these institutions is the lack of appropriate funding. As a result, admission to CONICET has been closed since 1993. This situation has caused much uncertainty for Argentinian scientists both in and outside the country. Last October, the new authorities of CONICET offered 160 new openings for academic positions. It was stated that the selection would be made according to the academic excellence of the applicants and their projects and that an equitable distri-

bution among areas of knowledge and regions of the country would also be considered. However, when the results of the selection were made public in April, it was clear that the academic excellence of the applicants had not been the main criterion of selection. This caused much frustration to many highly qualified scientists, who are now obliged to emigrate or remain abroad if they want to stay in the scientific system. Questions are thus raised about what kind of scientific system Argentina is choosing for its future.

In countries that support strong scientific systems, academic excellence has always been the main criterion applied in candidate selection. With this as a main goal, they then have established other ways to develop a more even distribution of resources across the country. The support of a scientific system of high quality is essential for undeveloped countries like Argentina. Actions like those taken by CONICET will clearly have the opposite effect.

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