

# European science must embrace modernization

Researchers in the United States benefit from having more money, mobility and flexibility.

*Sir*—As *Nature* has noted in recent News stories and Editorials, French researchers are revolting against their government's strategic policy on science, while the government criticizes the ossified structure of the research establishment (see *Nature* 428, 105 & 108; 2004). The German government has recently announced its intention of creating elite universities to match the best in the world (*Nature* 427, 271 & 477; 2004). And changes to UK research funding will probably concentrate resources in a small number of large and prestigious centres (*Nature* 428, 351; 2004).

These events indicate a major government-initiated modernization in science policy. European scientists who wish to work in an efficient system that produces top-quality work should embrace, not oppose, this new wave of modernization.

One reason for reform is the growing realization that — according to several quality and efficiency criteria, such as citation analyses — science in the United States is outperforming European science. And this gap is widening, especially when it comes to generating research of major importance (*The Economist* 369, 5–7; 2003).

One oft-cited difference between Europe and the United States is science funding, which is proportionately higher in the United States and concentrated in relatively fewer institutions.

However, as well as having more money, US science enjoys a greater diversity of independent public and private funding sources, a situation favoured by tax regulations and greater institutional autonomy (for example, in private research institutes).

There are also important differences

in the structure of scientific careers, such as the greater mobility of US researchers, including senior scientists, and the greater ease of hiring and funding foreign researchers and PhD students.

Together, these factors largely prevent the ossification of research institutions, and fuel productivity and innovation.

If European governments wish to match the results of US science, policy reforms will need not merely to address the funding inequality but also to create career and funding structures that generate increased competition and differential rewards among both scientists and research institutes.

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## Reliable regional climate model not yet on horizon

*Sir*—We agree with the overall thrust of your News story “Modellers deplore ‘short-termism’ on climate” (*Nature* 428, 593; 2004), with one exception. The US National Assessment of the Potential Consequences of Climate Variability and Change (USNA) — in which we were involved — did not attempt to provide regional or even national predictions of climate change, as was implied in the article. Nor, in our opinion, did it oversell the capacity of regional climate models to provide useful information.

The USNA report was explicit about its use of a range of approaches (mostly using projections from global climate models) to generate plausible scenarios of future climatic conditions that could then be used to explore the potential consequences of these scenarios for the environment, natural resources and people.

When the USNA performed regional analyses of global climate model projections, for specific areas of the United States, it did so in a way that cancelled out much of the systematic bias of the global models. This approach allowed the USNA to explore, for example, the responses of vegetation cover, agricultural production and water resources to the general character of the climate change expected during the twenty-first century.

Part of what the USNA learned and presented was a very clear description of

the confidence the authors felt could be assigned to their conclusions. In most cases, the lack of true predictability of the climate results meant that the USNA presented many caveats to its findings.

Even a cursory reading of the USNA findings ([www.usgcrp.gov/usgcrp/nacc](http://www.usgcrp.gov/usgcrp/nacc)) makes clear that they are not dependent on the regional details of the projected changes in climate.

For example, global warming is very likely to lead to reduced spring snowpack in the western mountains of the United States, reducing water resources; greater evaporation during the summer in the central states, lowering river and lake levels; a higher heat index that would endanger health in the humid eastern and southeastern regions; significant shifts in the landscape; rising sea level that will affect several low-lying regions, and so on.

We strongly agree that much more reliable regional climate simulations and analyses are needed. However, at present, as the News story makes clear, such simulations are more aspiration than reality.

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## Fame and popularity are no bar to Royal Society

*Sir*—Contrary to your News in Brief story, “Popularizer Greenfield is blackballed by peers” (*Nature* 429, 9; 2004), Susan Greenfield has not been “blackballed” by the Royal Society, nor have we “decided not to admit” her. Your report neglected to point out that candidates are eligible for election as a fellow for up to seven years after nomination, in the first instance, and they are considered afresh each year by new panels of distinguished scientists.

Professor Greenfield is a candidate for the fellowship of the Royal Society on the basis of her substantial contribution to science. Like all the other 535 candidates this year, she was nominated by current fellows.

It is also untrue that we “declined to go into detail about the nomination process”. The details of the nomination and election process are published in the yearbook of the Royal Society and on our website ([www.royalsoc.ac.uk](http://www.royalsoc.ac.uk)). For obvious reasons, the discussion by the panels of individual candidates remains confidential. Indeed, the identities of all candidates should remain confidential and it is deplorable that there has been a breach in Professor Greenfield's case.

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