

# Dangerous nuclear whispers

Voices within the Obama administration threaten to undermine non-proliferation efforts. They should be ignored.

In April, US President Barack Obama told a crowd in Prague of his hope for a world free of nuclear weapons. Achieving such a vision would take “patience and persistence”, he said. But we “must ignore the voices who tell us that the world cannot change”.

Unfortunately, some of those voices belong to powerful figures within Obama's own administration. Last month, the non-proliferation news site Global Security Newswire reported that the defence secretary, Robert Gates, has been quietly lobbying for the reinstatement of a programme to build a new generation of ‘reliable’ nuclear warheads. The same report suggests he has at least tentative support from two key cabinet members: Secretary of State Hillary Clinton and energy secretary Steven Chu. However, pursuing this programme would do nothing to improve the reliability of the US nuclear arsenal. Instead, it would seriously damage Obama's efforts to reduce the threat posed by the world's most deadly weapons.

Since 1992, the United States has held a voluntary moratorium on nuclear testing. During that period, scientists at the nation's nuclear-weapons laboratories have used computer simulations and non-nuclear tests to ensure that the existing weapons are safe and dependable.

During the administration of President George W. Bush, however, some weapons scientists sought to move beyond this post-cold-war caretaker role, and pushed for the development of low-yield and earth-penetrating nuclear weapons that could be used against conventional military targets. Congress halted those projects for fear they would rekindle the arms race. So the scientists came up with a supposedly more benign warhead concept. Dubbed the Reliable Replacement Warhead, it would require less maintenance than existing weapons, and would last longer. One argument was that the plutonium in current-generation weapons was degrading because of its own radioactivity, and that this, over time, would make the devices too unreliable to use. Another, which Gates repeated in a speech last October, was that the new weapons would not require testing. Ulti-

mately, he asserted, such devices would allow the United States to further lower its nuclear stockpile.

Yet such arguments are spurious. Studies by the weapons labs themselves show that the nuclear material within existing devices will last for decades (see *Nature* **444**, 660–661; 2006). Experienced nuclear-weapons scientists believe that it would be irresponsible to deploy a warhead without testing it first. And there is no reason that the stockpile could not be reduced without building a new nuclear warhead.

Gates is now leading a major administration review of the entire nuclear-weapons complex, including the reliable-warhead proposal. That review comes at a crucial time for its non-proliferation agenda. Obama is currently pursuing Senate ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), an international prohibition of nuclear-weapons testing. Next year, his administration will also take part in an international review of the Non-Proliferation Treaty, the main international tool to limit the spread of nuclear weapons. For the United States to be developing a new warhead during this period would look to other nations like rank hypocrisy. Moreover, the replacement programme's very conceit, that existing warheads may not be reliable for much longer, will probably fuel conservative resistance to ratification of the CTBT.

Hopefully, the nuclear review will decide against recommending any sort of replacement programme, ‘reliable’ or otherwise. But if it does not, then Obama should have the courage to reject the plan. The US nuclear stockpile is more than adequate to defend the nation's territory and that of its allies for decades to come. If Obama truly wishes to lead the world in nuclear disarmament, then he should do so with the warheads the nation already has. ■

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## Cash costs

Massive funding for Pakistan's ailing universities holds many lessons for other developing nations.

Eight years ago, a task force advising Pakistan's former military ruler, General Pervez Musharraf, laid out a bold plan to revitalize the country's moribund research system: initiate a fivefold increase in public funding for universities, with a special emphasis on science, technology and engineering. The proposal was a radical departure from conventional wisdom on the economics of developing nations, which favours incremental investments. Sudden surges of cash are held to be dangerous in poorer countries, which often lack the institutions

or the calibre of people required to make the most of such a windfall, and the money can easily be wasted or fall prey to corruption.

Nonetheless, Musharraf agreed to the proposal. The reforms began in 2003. And the results, which have now earned a qualified thumbs-up from a group of experts in science and education policy (see page 38), offer some valuable lessons for other developing nations.

First, conventional wisdom isn't always right. Despite early doubts that Musharraf's autocratic regime could allocate the new funds effectively, the experts cite initiatives such as a free national digital library and high-speed Internet access for universities as examples of success, as well as new scholarships enabling more than 2,000 students to study abroad for PhDs — with incentives to return to Pakistan afterwards. And they acknowledge that the years of reform have coincided with increases in the number of Pakistani authors publishing in research

journals, especially in mathematics and engineering, as well as boosting the impact of their research outside Pakistan.

Second, human capital matters. One concern raised by the report published in this issue is that the 3,500 candidates for Pakistan's new domestic PhD programmes have had lower qualifications than the candidates going abroad. But that is a situation that should correct itself over time as Pakistan's schools improve. For the time being, the more important point is that Pakistan has opened up the chance of a research degree to many more people than in the past — including those who do not have wealthy families, or access to influential people, or good skills in European languages. Harnessing those reserves of talent is an integral part of any nation's development.

Finally, accountability is essential. This was not a priority for the architects of Pakistan's educational reform, partly because they were working for an autocratic regime, and partly because they were in too much of a hurry. The government seemed to be living on borrowed time, Musharraf's science adviser, Atta-ur-Rahman, has recalled. On the one hand, politicians, judges and lawyers were pressing for a return to democracy; on the other, the influence of the Pakistani Taliban was

increasing. Suicide bombers twice tried to assassinate Musharraf — once by blowing up his motorcade as he returned from making a speech to scientists. If the reformers didn't get their programme in place quickly, they feared they might not get it in place at all.

The result, however, is that the body created to implement the reforms, the Higher Education Commission, has operated with minimal oversight by academics, parliamentarians or anyone else. There has been some waste, although no one has yet accused the commission of egregious abuses of power. But it has exhibited blind spots that an outside influence might have corrected — notably a total lack of investment in the social sciences and policy research, disciplines that encourage the asking of questions that autocratic regimes frequently dislike answering.

This must change. Pakistan is no longer a dictatorship. The elected government, under President Asif Ali Zardari, has expressed cautious support for continuing Musharraf's education reforms. It therefore has an opportunity to build on their successes and correct their shortcomings — starting with an independent review of the commission's performance. ■

## US visa nightmares

Barriers faced by foreign scientists seeking entry to the United States do more harm than good.

Over the years, the United States has benefited enormously from its ability to attract the most creative scientific minds from around the globe. Increasingly, however, scientists, postdocs and students are turning elsewhere, frustrated by the barriers to gaining entry that sprang up in the wake of the terrorist attacks of 11 September 2001. In its current incarnation, the US visa application process not only presents a bewildering tangle of directives, prerequisites and requirements, but has also forced some applicants to wait up to a year for their visa to be approved — often for no apparent reason.

It is true that waiting times are improving. In late May, in response to mounting protests from the scientific community and elsewhere, the Department of State, which oversees the processing of student and exchange visas, added staff and resources, and implemented new procedures to cut delays. The department established a 10-day deadline for most applications that require 'administrative processing', a particular security check required when the applicant is from certain nations or does certain work. Among those getting fast-tracked is the Visa Mantis security check, the type that most often affects scientists.

'Routine' approvals should take only a few days, and never longer than a month, the state department says (see page 131). In an effort to pinpoint and resolve other visa-related problems, the department meets regularly with an inter-agency group that includes the Department of Homeland Security, which handles employment and other types of immigration visas. A meeting is scheduled for this week.

But reducing waiting times for visa approvals fixes only one part of an inept and dysfunctional system. Consider, for example, the impenetrable snarl of bureaucratic requirements that an individual must meet before even applying. A list on the state department's website

of required documentation for all students — not just nuclear physicists, or scientists from countries that sponsor terrorism — is an eye-glazing jumble of acronyms, abbreviations and conditions. It shouldn't be this complicated.

Then there are the requirements and conditions of various visas. Almost all applicants must prove that they plan to return to their home country when the visa comes to an end. Those who receive government funding, or whose speciality is on a skills list negotiated by their home country, must return home for two years once the visa expires. Meanwhile, student applicants, as well as postdocs or scientists applying for an exchange visa, must prove that they can cover their expenses.

Employment-visa applicants face their own woes. There is an annual cap of 65,000 such visas for individuals being employed by private- or public-sector companies, plus another 20,000 for individuals with at least a master's degree from a US institution. Applications are accepted each year from 1 April. If the cap is reached before an individual's application is processed, his or her only recourse is to reapply the next year — and risk losing the job.

Capitol Hill staffers say that several legislators are keen to simplify or even throw out many of these rules, but add that the visa troubles are part of a much larger immigration-reform problem. Given the many other issues facing Congress at the moment, from health-care reform to financial reform, action on immigration seems unlikely before next year at the earliest. And even then, months of debate will be required before any new legislation passes — legislation that may or may not address the visa challenges.

So in the meantime, US agencies should act quickly to streamline the application process as far as possible without legislation. All caution should not be abandoned, but at the same time it should not be so difficult for a scientist or student to seek entry to the country for scientific purposes that have no link with terrorism. The United States cannot continue to bar the door to some of the very people it needs most. ■