

South Africa's opportunity

The nation's science enterprise still carries the scars of apartheid. But with reform — and increased funding — South Africa could become a catalyst for scientific progress throughout Africa.

Twenty years after South African anti-apartheid activist Nelson Mandela was released from a government prison — and 16 years after he became the first South African president chosen in an election open to people of all races — the country's science system continues to experience difficulties. In addition to inadequate funding, it suffers from a lack of qualified research students that is a direct result of the government's failure to address the legacy of apartheid education.

However, there is reason for optimism. The South African research community's long alienation from the government, which emanated largely from former president Thabo Mbeki's denialist stand on AIDS, is at last a thing of the past. And in May 2009, newly elected president Jacob Zuma appointed Naledi Pandor as his minister of science and technology. Her role as education minister in the previous cabinet has given Pandor a firm grasp of the problems facing science in South Africa. And because she is the first incumbent at her ministry to be a member of the ruling African National Congress, she has the requisite clout to effect reform.

One of Pandor's priorities should be to rethink South Africa's propensity for chasing high-profile 'big science' projects, such as its bid to host the Square Kilometre Array of radio telescopes, or its efforts to develop a pebble-bed reactor for nuclear power. Between them, these two projects have committed more than 10 billion rands (US\$1.3 billion) in scarce government funds. Instead, the government should be giving its top funding priority to areas in which South Africa has both expertise and a natural advantage, such as archaeology, palaeontology, clinical medicine, mining technology, botany, zoology and geology.

A more intractable task for South Africa will be the reform of education. Stark racial inequalities still prevail in the South African schooling system, and their effects are felt at both undergraduate and postgraduate levels. According to the most recent available data, South African whites in the 25–34-year age group are 28 times

more likely than their black African counterparts to be enrolled in a PhD. Moreover, only a small proportion of younger students earn university-entrance qualifications in mathematics and physical science, and most of those who do end up working in more lucrative fields, such as medicine, engineering and commerce. The result is a severe shortage of students attracted to research careers in science, and an even worse shortage of students willing to consider careers as teachers of school-level mathematics and science — a lack that only perpetuates a vicious circle.

The best way to recruit good teachers and academics is by offering much better salaries, decent working conditions and good facilities. But this will require significant financial commitment by the government, as well as cooperation between the departments of education and higher education. Nonetheless, as South Africa emerges from the recession this year, it would be one of the wisest investments Zuma's government could make. Perhaps the National Planning Commission, which is headed by the highly regarded former finance minister Trevor Manuel, could provide a mechanism by which such a huge task might be achieved.

For all of its problems in science, South Africa has a solid and productive core of university-based researchers. And since the end of apartheid, the country's universities have been enriched by significant numbers of students from other African countries. South Africa thus has the potential to become not just a major player on the international research stage, but also a catalyst for the development of science throughout the continent. There is a huge pool of talent waiting to be tapped, and it is up to Zuma, Pandor and other political leaders to put in place the money and systems with which to tap it. ■

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Divide and conquer

NASA is taking a risk on commercial space services. But the pay-offs could be high.

Last week's federal budget proposal put the nail in the coffin for Constellation, NASA's expensive system of rockets and capsules that was to replace the ageing space shuttles and send humans back to the Moon. Influenced by the bleak assessment of a high-level advisory panel last year (see *Nature* 461, 153; 2009), NASA is abandoning its Moon mission even though it has already spent US\$9 billion on the rockets. For now, the idea is to nurture

competition between commercial space companies with the aim of lowering the ever-increasing cost of putting payloads and people into space.

At a press briefing by NASA administrator Charles Bolden in Washington DC last week, the sight of the seven men and women clustered in front of him could not help but evoke memories of the 1959 introduction to the Mercury Seven, the first US astronauts to rocket into space. Except that this time, the seven people were not astronauts, but executives of commercial space companies.

With the death of Constellation, Bolden has little choice but to put his faith in these executives. President Barack Obama's budget proposal would offer \$6 billion of incentives to privately owned launch companies over five years, to encourage the development