

But it has not taken a position on whether the cloning of human embryos for research purposes should be outlawed. Last September the federation adopted a voluntary moratorium on human cloning (see *Nature* **389**, 319; 1997).

In a separate move, 55 medical and patient advocacy groups, including the American Academy of Pediatrics, the American Association for Cancer Research and the American College of Medical Genetics, have written to members of Congress asking that any legislation should do "no harm to biomedical research".

## British drugs companies in mega-merger plan

[LONDON] The British-based pharmaceutical companies GlaxoWellcome and SmithKline Beecham have announced plans to merge, creating what the two companies describe in a joint statement as "the largest research and development organization in the global healthcare industry".

The new company — expected to be called Glaxo SmithKline — will have a market value of more than £100 billion (US\$150 billion), and a combined worldwide workforce of 110,000. But heavy job losses are expected, particularly among scientists working in areas of research where the two companies' efforts overlap.

## Green light for sales of leprosy vaccine in India

[NEW DELHI] The Indian government has authorized the sale of what is claimed to be the world's first leprosy vaccine. It took two decades to develop, and will be made by Cadilla Pharmaceuticals of Ahmadabad. No major side effects were noticed after clinical trials using 80,000 doses.

India has 60 per cent of the world's 1.15 million leprosy cases. Treatment usually entails a three-year course of multiple drugs, with varied results. A course of treatment with the vaccine will last between six months and a year, and will cost US\$1.25. The vaccine will be available from June.

## Challenge ahead for boss of Euro research centre

[AMSTERDAM] Herbert Allgeier has been nominated as the new director-general of the European Commission's Joint Research Centre (JRC), which comprises seven institutes in Italy, the Netherlands, Belgium, Germany and Spain. Allgeier, an engineer, currently directs the commission's advanced communication technology programme and coordinates its air and space activities, a position he will retain.

In his new appointment, announced last week, Allgeier will have to respond to

increasing pressure, particularly from the European Parliament, to reorganize the way in which the JRC's institutes are run and to increase the quantity and quality of their scientific output.

## Setting sail to study underwater volcano

[SEATTLE] Oregon State University is to send a research ship to investigate an underwater volcano, Axial Seamount, that has been erupting off the Oregon coast for the past week. Chris Fox, a geologist with the National Oceanic and Atmospheric Administration, says the eruption has not been seen. But he says it is likely that rivers of red-hot lava are flowing out of the volcano, along with giant plumes of scalding, mineral-rich water carrying microbes that thrive beneath the ocean floor. The volcano is 4,500 feet high. Its peak is nearly 4,000 feet below the ocean surface.

## Correction

In last week's article on New Zealand (*Nature* **391**, 426; 1998), an editing error led to the statement that, in the five years to 1995–96, the number of support staff in Crown Research institutes "tripled to more than 900". This should have read: "increased by about 350 to more than 900".

# New Zealand puts its science to profit

Peter Pockley

**Six years ago the New Zealand government decided to make a number of radical changes in its approach to science funding. Supporters and critics remain divided on the outcome so far of its new strategy.**

[WELLINGTON] Six years after the government of New Zealand introduced sweeping changes in its handling of science — the most dramatic being the dissolution of the 66-year-old Department of Scientific and Industrial Research (DSIR) — there are mixed views about their overall effect.

Even though New Zealand has slipped down the scale of science funding in international terms, supporters of the changes point out that research is now more tightly targeted on areas likely to benefit the country.

But many science and university leaders are concerned that, after several years of gradually increasing research budgets, the government may 'cap' its support this year, undermining recent gains and triggering disillusion about its commitment to research.

The changes followed a deep cut in funding for research and development (R&D) among many areas of public spending dur-

ing the country's economic crisis in the mid-1980s. This crisis persuaded the government to restructure the system of public services, with almost all public utilities and services being either privatized or corporatized as 'State Owned Enterprises'.

Designed by a Labour government and implemented by its National Party successors, the new system separates public organizations into three types of bodies: 'policy organizations', such as ministries and other government bodies; 'purchasing organizations', which provide funds; and 'providers', which in science are research organizations.

The application of these principles to the public science sector led to ten specialized Crown Research Institutes (CRIs) being set up as private companies out of the dismembered parts of DSIR and other government research units supporting the dominant agricultural industries (see below).



**Mind the gap:** Researchers' study characteristics of the Edgcombe earthquake in March 1997.

The changes involved large-scale job transfers and job losses among 4,000 staff, and cost NZ\$42 million (US\$24 million). There has also been a marked shift in employment in CRIs from research staff to non-scientists. In the five years to 1995–96, the number of researchers fell by almost 300 to just over 1,300 full-time equivalent staff, while support staff tripled to more than 900.

With research now seen as a 'commodity' to be 'bought' by purchasing organizations from research institutes — and supposedly subject to competitive pricing — New Zealand's science is tightly controlled.

Officials extol their approach as a model for other small countries. Even critics who describe the changes as "an uncontrolled experiment" admit that there has been a gradual upward trend in budget allocations.

But there are signs this rise will level out in 1998. And some scientists fear that the coalition government will cut spending on R&D by as much as NZ\$40 million to fund promised reductions in taxation and provide extra resources for the more politically popular fields of health and education.

Total government funding for R&D still amounts to NZ\$591 million in this financial year, including about NZ\$95 million for university research. But the Minister for Research, Science and Technology, Maurice Williamson, admits that future prospects for science and technology are not good.

Although "there will be no reduction in government research spending," he says that "baselines won't grow", and points out that the government would need to spend an extra NZ\$25 million on research in this year's budget, due in May, to keep up with gross domestic product (GDP), currently growing at about four per cent a year. This is seen as a warning that the extra funds will not materialize.

In international terms, New Zealand's support for R&D keeps it near the bottom of

## 'Purchasing' policy still stirs heated debate

In New Zealand's new system for supporting science, Crown Research Institutes (CRIs) operate as commercial companies, with their own boards and two government ministers as 'shareholders'.

They must attain 'profit targets' — surpluses of government grants and 'private' earnings over expenses — set by the government, which are then retained for investment.

The 'purchasing' of science is carried out by the Foundation for Research, Science and Technology (FRST). It distributes the so-called Public Good Science Fund (PGSF), rather like competitive grants bodies elsewhere except that it is told by the government how to divide up its funds, currently NZ\$282 million (US\$161 million).

Grants are allocated by panels according to priorities

set for 17 categories linked to commercial, industrial, agricultural, social or environmental sectors. These have now been joined under the jurisdiction of Williamson by the NZ\$24 million health research grants.

As the largest recipients of PGSF support, with NZ\$230 million this year, the nine CRIs depend on FRST for funding, which must be competed for every two years. Selection depends on research being cost-effective and relevant to national needs.

Critics say this resulted in a short-term, applied focus of research funding. But Stephen Thompson, FRST's new chief executive, describes the fund as "an investor in science".

Sean Devine, director of the Association of CRIs, challenges descriptions of the system as a market, saying it is "contrived, far from ideal

and extremely one-sided".

He believes pricing may shift successful grant applications from the highest quality towards "a greater volume and mediocrity". But Andy West, who helped set up the system, describes the reforms as "a solid success".

West was recently appointed chief executive of the Institute of Geological and Nuclear Sciences Limited (IGNS), the smallest institute with a 1996–97 budget of NZ\$24 million. It won research contracts worth \$17.9 million from government last year, the rest of the income coming from the private sector. It retained its operating surplus of NZ\$564,000, rather than repaying it to the Treasury.

Williamson's predecessor, Simon Upton, says the CRIs will not be privatized. But West queries "the whole notion of governments owning research institutes".

P.P

## Government under fire from academics

members of the Organization for Economic Cooperation and Development (OECD). Public spending in 1992–93, when the restructuring took place, accounted for 0.59 per cent of GDP; three years later, it had slipped to 0.52 per cent, compared with an OECD average of 0.69 per cent.

Simon Upton, Williamson's predecessor, committed the government to a target of increasing this to 0.8 per cent by 2010. But Williamson says there has been "a loss of 'security of tenure' in our coalition government". And even Upton now admits that the prospects of a full government commitment to what he sees as an investment in the future "are in the balance".

Also under threat is another promise made by Upton that NZ\$30 million would be provided next year to the Marsden Fund, a scheme launched in 1994 that provides competitive grants for basic, non-targeted research in universities and CRIs.

Ross Moore, chief executive of the Royal Society of New Zealand, which administers the fund on behalf of the government, believes this goal is "in jeopardy". Indeed, with the value of the fund now standing at NZ\$22 million a year, and only one applicant in 13 being successful because of the fierce competition, any increase this year is unlikely to be more than NZ\$1 million. Sir John Scott, the society's president, describes the reduced funding as "a serious blow".

In a speech two months ago, Sir Ian Axford, who chairs the Marsden Fund, confirmed his support for the 1992 reforms, arguing they were necessary because the government had lost confidence in the former leaders of public research bodies.

But, while describing the system as "fairly reasonable", he argued that it was "ponderous and too concerned with process rather than purpose". Axford also criticized the policy of allowing science to be driven by market forces.

He also said the government must intervene to identify research priorities: "Unfortunately the level of our technology is rather low, and we desperately need to do something about it".

Scientists, said Axford, were now "too easily treated as seasonal workers who can be dropped and picked up on demand." Jobs were subject to individually tailored contracts, often limited by short-term grants.

One result is the difficulty for young scientists in establishing research careers, many having to settle for technician-grade posts that provide no chance of winning grants from the so-called Public Good Science Fund in competition with established scientists.

Megan Ogle-Mannering, for example, who holds a PhD in plant ecology from Otago University, recently left New Zealand after trying unsuccessfully for two years to find a post in which she might apply her training. She is now studying science com-

To the disappointment of researchers, Maurice Williamson, New Zealand's Minister for Research, Science and Technology since 1996, has dropped the practice of his predecessor, Simon Upton, of consulting widely and directly with scientists, depending solely on policy advice from the 34 members of his ministry.

Where specific studies are needed, they are usually commissioned from the Royal Society of New Zealand under contracts worth NZ\$1.4 million this year. Established in an act of parliament, which was recently revised to extend its coverage from traditional to social and applied sciences, the society is officially independent of the government.

But maintaining its autonomous role is a delicate matter. In a celebrated spat starting in 1995, Philippa Black, a geologist and then president of the society, was declared *persona non grata* by Upton for criticizing the science system he championed (see *Nature* **379**, 112 & **380**, 282; 1996).

Black says: "If anything my views have strengthened since then with the current strain on funding, including the impossible infrastructure position of PGSF, and



**Black: critical of new system.**

Marsden grants not allowing purchase of equipment costing more than \$5,000, and the high costs of managing research."

Sir John Scott, recently elected as the society's new president, describes the government's position on science as technically amounting to cuts, which he finds "very depressing". He says he runs the same risk as Black in describing the restructuring of the economy and science as "experimental and too dependent on accountants".

George Petersen, president of the academy council of the society and a biochemist at the University of Otago, says that one of the problems in New Zealand science is how to boost the morale of scientists, which he describes as being "at an all-time low", especially in universities.

He sees the 'technology foresight' process planned by

the government (see below) as not being properly linked to funding, educational and scientific workforce requirements.

In a joint statement, Scott and Petersen say they urgently need to lobby the government to influence long-term policy "without being continually knocked back with the response that scientists are just looking after their own interests".

The New Zealand Association of Scientists (NZAS) is less cautious. Its president, Brion Jarvis, a retired microbiologist, says he was elected because of his advocacy of science and his ability to comment freely, now that he is no longer bound to any organization.

Evenly split between universities and CRIs, the NZAS speaks for CRI staff who are prevented by their contracts from speaking publicly on policy issues.

Jarvis says there is a "groundswell of discontent" among CRI scientists and uncertainty over jobs. Indeed a US Fulbright scholar, Jack Sommer, found in 1995–96 that only a quarter of CRI researchers felt they could speak freely on public policy issues. Most said their job satisfaction has decreased in the past two years. **P.P.**

munication in Australia.

A further problem is the continuing lack of investment in R&D from the previously highly protected private industry sector. Those responsible for introducing the new system had promised initially that it would stimulate such investment. But it remains stubbornly low, standing at only 0.26 per cent of GDP in 1995–96; indeed, a survey last year found that expenditure declined from NZ\$248 million in 1993–94 to NZ\$240 million in the following year.

Williamson and the new prime minister, Jenny Shipley, have both acknowledged the urgent need for New Zealand's industry to become more competitive internationally, but are aware of the difficulties. Both place their hopes in a two-year consultative study of national goals and needs using the techniques of 'technology foresight' (see *Nature* **390**, 651; 1997).

By using focus groups and media publicity, the government hopes to stimulate public enthusiasm for science, in the belief this will lead to an increased emphasis on research in both public and private investment and will help shift priorities within science to the needs of high-technology industries.

One important barrier to such a change in attitude appears to be the powerful Treasury, which remains opposed to government intervention. But government officials say they are optimistic about the new strategy.

Jill White, the Labour opposition spokeswoman for science, also says she welcomes the 'foresight' study but "only if the commitment to extended funding to reach the 2010 target is delivered". Williamson's statements, she says, appear to show that the government is "renewing with a weakening commitment to science". **Peter Pockley**