SPECIAL REPORT

Saving Italian science

As the general election looms, candidate prime minister Romano Prodi strives to convince Italy's discontented scientists that he can turn things around. **Alison Abbott** reports.

Last autumn, Romano Prodi, a candidate for Italian prime minister, proposed a thought experiment to a group of top scientists. "If you had an additional €400 million (US\$480 million) a year for five years to rescue Italian research, to be allocated during the first 100 days of government, what would you do with it?" he asked.

Prodi had summoned 20 or so scientists to his *Fabbrica*, a think-tank housed in Bologna where he has been developing his government platform.

The short answer came fast: "We would double the number of researchers." Italy's research force is currently half the size of comparably large, rich countries. The longer answer comprised a ten-page document published last December, which lists the many problems with Italy's underperforming research sector, and how they might be tackled. The bottom line: too much bureaucratic incompetence and an unreasonable demand for immediate returns, as well as too little money and meritocracy.

The conclusions won't surprise most Italian scientists. "Physicists have developed a theory for chaos, but Italy is now running an experiment in chaos," comments Carlo Rubbia, a 1984 physics Nobel laureate and, until last year, president of the Italian energy and environmental agency ENEA.

But the document proposes how to bring order. Its concerns and recommendations are now feeding back into detailed action plans for a government science programme that can be agreed by all nine parties of Prodi's centre-left Olive Tree coalition.

Mathematician Luciano Modica is a former head of the Conference of Italian University Rectors (an association of university chiefs), and now a member of Prodi's union. He says, for example, that the document's proposal for an independent authority to evaluate research done in all publicly funded research institutes and universities is now a central concept in the proposed government programme. "It would eliminate the unfair and inefficient elements in the Italian academic system," he says.

The scientists summoned by Prodi, none of whom is affiliated to a political party, argue that the problems have been there for decades, but have worsened in the past four years of Silvio

Berlusconi's rule. The government has reduced Italy's scarce science funds for basic research, they say, and oriented the sector to applied research. Berlusconi's centre-right coalition has not issued formal statements about science in the run up to the elections next month, but sources close to Berlusconi indicate a continuation of this philosophy.

Uphill struggle

"The situation wasn't good before, but the Berlusconi government made it much worse," says Giorgio Parisi, a theoretical physicist at the University of Rome, 'La Sapienza'. "Perhaps the worst thing that has happened has been damage to the research agencies," adds Massimo Inguscio, an atomic physicist at the University of Florence. He says a series of much needed but failed reorganization attempts over the past decade have left agencies like the National Research Council (CNR) and the National Institute for the Physics of Matter with unclear sets of rules, imposing a culture of extreme uncertainty, "which is not supportive of free research".

Others have openly criticized Berlusconi's set of politically appointed agency heads as scientific lightweights, who lack the charisma needed to defend the Italian tradition of research (see 'Careless with the truth').

Curiously, the problems of Italian scientists have not so far translated into an equivalent dearth of high-quality research. Given the difficult conditions in which many have to work, the output in fundamental research is relatively impressive; in number of publications and publication impact, Italy scores seventh out of the world's 140 highest-performing countries. Some point out, however, that the latest assessments include data that are already five years old, so may not reflect the harder times that have come recently.

As Italy spends only half the European Union average on research and development, the issue of money is on everyone's mind. But most agree that more money alone is not the answer. Fil-

Until 1998, university jobs were announced centrally in Rome.

ippo Andreatta, a political scientist at the University of Bologna and one of Prodi's chief advisers, says that although more money is foreseen — that indeed was the point of Prodi's thought experiment — funds will be limited as Italy is struggling to stay out of recession. More important, he adds, a centre-left government would "turn upside down how we give money".

In effect this means making new rules to ensure fair and effective competition for research jobs and funds. This may not be music to the ears of Italian scientists, who

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Arch rivals: Romano Prodi (right) is promising to rescue Italian science in a bid to oust Silvio Berlusconi.

despair of what they call *La riforma continua*, referring to the reforms to research organizations and recruitment procedures that began with Prodi's first term of office in 1996, and that have not stopped since.

The CNR, for example, which runs 100 research institutes, has had three major but ineffective shake-ups in the past decade. And, hampered by the confusion, universities are still trying to achieve the goals of a 1990 law that gave them autonomy to run their own budgets. Continuing uncertainty over rules has meant that few new research programmes have been launched.

But Rossella Palomba, a social demographer at the CNR Institute for Population and Social Policies in Rome, and a member of Prodi's group of scientists, says that "some restyling is unfortunately necessary, at least to ensure that academic recruitment allows us to hire the best people".

For those used to seeing academic positions advertised publicly as soon as they become available, the system of Italian recruitment

competitions, or *concorsi*, seems incomprehensible. Until 1998, all jobs at universities and research institutes were organized centrally in Rome; every year or two, there would be a single mass announcement, and phone systems would become jammed with personal lobbying. Since then, a series of changes have attempted to leave recruitment decisions to the institutions involved, while trying to discourage the tendency to recruit locally.

Chaotic inclination

But because many universities continued to fail to recruit outsiders, research and education minister Letizia Moratti reintroduced a type of centralized *concorsi* system, in a decree that was forced into law last November.

This recentralization would be reversed by a centre-left coalition, says Modica. "We need to create an environment where universities both have the right to choose their own candidates and feel compelled to choose the best." He favours "a controlled ten-year transition linked to evaluation, to allow universities to adapt to a new culture where they are penalized if they recruit poorly".

The Olive Tree coalition also foresees two other policy changes. One would tone down the emphasis on research with immediate applications, introduced by the Berlusconi government. This industry-friendly philosophy included reorienting the CNR's mission from fundamental to applied research. Despite its unpopularity among scientists, Fabio Pistella, appointed by the government as the CNR president in July 2004, says the focus on applications must continue. "Italian industry invests little in research and the CNR's mission is now to fill this gap — scientific papers are not the only measure of success of a good research organization."

The other shift in policy would reintroduce sources of research grants that have all but dried up, as well as more conventional mechanisms for distributing them. Even the CNR has virtually no money for actual research projects; most of its budget is eaten up by running costs.

The CNR researchers can team up with university professors who are eligible to apply for scarce university project grants distributed by the research ministry. But the ministry has also come under attack for inefficient management of the grants. One international research programme rejected 60% of its grant applications as invalid — including many from very experienced researchers.

Cell biologist Jacopo Meldolesi from the Vita Salute San Raffaele University in Milan,

CARELESS WITH THE TRUTH

Several high-ups in Italy's research organizations have come under fire for making dubious boasts.

● **The CNR president Fabio Pistella** claims to have 150 scientific publications on his CV; this was submitted to the Italian parliament in support of his presidential nomination in 2004. But *Le Scienze* reported in January 2006 that ISI cites only three publications by him. Pistella told *Nature* that some of his publications are old and in Italian, "and the roles of the CNR president in any case require management skills".

● **Claudio Regis, the vice-commissioner of ENEA, the Italian environmental agency**, uses the formal title 'Engineer'. But on 2 August 2005 the *Corriere della sera* newspaper reported that he is not listed as qualified with the Italian Guild of Engineers. Regis did not respond to requests for clarification.

● In the Bologna newspaper *Il resto del Carlino* on 3 January 2006, **Sergio Vetrella, the president of ASI, the Italian Space Agency**, was reported to have claimed that Italy will build a telescope on the moon. But the agency has no such plan. Vetrella told *Nature* he was misquoted, but the journalist argues that he approved the text. On 28 February, Vetrella announced a call from ASI's website for ideas for moon-related plans.

who is president of the Italian Federation of Life Sciences, had his application rejected before review for not meeting all criteria. This was despite him getting reassuring answers to his phone and e-mail enquiries. "Obviously the programme was not explained properly to applicants," says Meldolesi, who was also a member of Prodi's group of scientists.

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One concern that has found no consensus in Prodi's coalition is the issue of embryonic stemcell research. The research community would like to see more liberal rules, as the authors of the December document make clear. But Catholic and conservative coalition partners oppose loosening the embryo-protection laws, which are among the strictest in Europe.

Some things will have to wait until after the April elections, acknowledges Giovanni Big-nami, an astrophysicist at the University of Pavia, who chaired Prodi's group of scientists. But he says: "We were happy to have been consulted by politicians. That hasn't happened in a while in Italy."