

ITALIAN SCIENCE: GREATER EXPECTATIONS?

To the editor — I would like to share your optimism on the future of Italian research¹. However, past and present history leaves space for concern, regardless of the change of government. If the centre-right coalition has done little during its government (2001–2006), and in some cases has even created damage, the centre-left does not seem to fare better. The current academic promotion system, which favours in-house careers from PhD to tenureship, is a heritage of the first centre-left government (1996–2001). The new government, despite initial promises of boosting research funding, approved in July a 10% reduction in running budget. It seems to be very difficult to propose, let alone enact, effective changes in funding allocations, academic appointments and management because they touch too many interests across the public education and research sectors.

To improve Italian science, one should aim at addressing key issues, some of which are specific to the Italian system. The lack of funding, which is actually common to other countries, is made worse by the disproportionate weight of administration costs. In 2004, only 3% of the National Research Council (CNR) budget was spent on technical and scientific instrumentation, another 3% for fellowships, whereas 8% went to the Rome central administration alone². In this context, the lack of a long-term scientific policy is a crucial problem. While subsequent research ministries spend their time undoing their predecessors' work and giving their name to new, short-lived reforms, the continuous state of reform forces researchers to adapt to ever-changing regulations and institutions.

To brighten things up, young Italian researchers are required to lead a monastic life, that is, passionate, faithful, and poor. A PhD graduate is expected to live on grants for years. Scientist are likely to be 36 years of age before obtaining a position as a permanent researcher, 45 for an associate professorship and 52 for a full professorship³. As the mobility in the public sector is very limited, this means that young people work under their mentor's 'supervision' for the largest part of their career waiting for promotions. This naturally provides little incentive for personal initiative, and little funding opportunities to deviate from their supervisor's work.

Finally, Italian scientists should recognize that they share part of the blame for the present situation. They should play a more active role in engaging the public and politicians to explain why scientific research and education are important. A related problem is the lack of representative and influential associations of scientists, with the exception of medical doctors. Physics researchers, for instance, lack the equivalent of the American Physical Society in the US or the Deutsche Physikalische Gesellschaft in Germany. Their Italian counterpart, the Società Italiana di Fisica, resembles more a club of respected old physicists than a lively, representative body for all physics researchers — and it does its best to remain so, asking new affiliates to be signed in by two senior members before being allowed to pay its fee⁴. With such a poor spirit of belonging and no effective representation there is little wonder that Italian scientists stay under the spell of changing government winds.

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The 10% reduction in running budget was proposed in late July 2006, after the August issue editorial had gone to press
— Editor, *Nature Materials*

REFORM SCIENCE? FIRST, RESET THE ECONOMY

To the editor — In the August issue editorial¹, you show a cautious optimism concerning the future of Italian science. I disagree with that optimism, because I believe that the malaise of Italian science is intrinsically rooted in the present nature of the Italian economy. In my view, until the economy is drastically transformed there is no hope for Italian science.

Whereas in most 'rich' countries, a considerable part of the economy is based on 'high tech' industries, which absorb a significant proportion of science and engineering graduates, the Italian economy is largely based on tourism and 'lower tech' industries (in a manner of speaking), such as textiles and furniture, and offers few opportunities for highly trained scientists/technologists. There is thus a disproportionate pressure for Italian graduates in science and engineering to stay in academia, partly because national labs (for example, the National Research Council, CNR) are highly bureaucratic machines rather than cradles of exciting science, but mostly because of the lack of research and development in industry.

This lack of alternatives to academia is the reason for the current bleak situation, which has bred a total lack of transparency in competing for funds and positions and a lack of impartial evaluation leading inevitably to the present endemic cronyism. This has also resulted in the serious brain drain, which you have clearly pointed out. Although it is quite normal and even healthy in science to "fight for funds and power" as you mentioned, in healthier systems elsewhere the rules of the game are fairly clear and transparent. In Italy, the scientists who have chosen to stay are now more like hungry dogs fighting over a bone, under a blanket of secrecy.

In present-day Italy, even the promising academic projects of the 'winners' lack the industrial-end users necessary to take the next step in research and development and thus give something tangible back to the taxpayers. The mission of universities is to train highly

qualified personnel, many of whom can then join the workforce, but if there is no enterprise to absorb this potential workforce, what is the use of training them? Italian science serves only as a public-relations device to give a spurious appearance of a truly technologically healthy economy, but with little output of useful technology.

Finally there is another negative aspect, and one that is not limited to Italy but is endemic in Europe, namely excessive hierarchy in academia. With few exceptions (perhaps the UK and Switzerland?), young scientists in European universities now find themselves imprisoned in a hierarchical structure that affords little to no independence, and this ultimately stifles their creativity and hinders their performance. More often than not, the junior scientists do not receive a fair share of credit for their work. In North America the situation is quite the opposite: once you land a faculty position — which is hard to do — you are pretty much on your own, and your hope of earning promotions and tenure is directly linked to your ability to work independently. Ultimately this is perhaps the main reason why, despite the recent rise in research and development public funding across Europe (which includes the ambitious plans to create a European Research Council), the brain drain towards North America is still very significant. The present dominance of hierarchy is thus perfectly tailored to exporting the best and most aggressive young scientists.

Unless this perverse trend is inverted, and young scientists are given the opportunity to become truly autonomous in the early stages of their career, further increasing public funds at the Italian/European level will amount to a waste of money,

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