

Science in Europe

How to Create a Thriving Environment for Science

by Claudio Bordignon and Roberto Sitia

“Science is our destiny, as Europeans,” pronounced Fotis Kafatos, Chairman of the Scientific Council of the European Research Council (ERC) last January at the official presentation of the new research-funding agency in Milan. Most politicians and economists would probably agree, since there is no doubt that investing in research and education is Europe’s sole hope for maintaining our current living standards.

When we were asked to write about how to create a thriving environment for science in Europe, able to compete with the USA, the first question that came to mind was, “Why does this environment not exist already?” On a continent of 500 million people, most with high *pro capita* incomes, what went wrong? Well, let’s not be too pessimistic:

all did not go wrong, and many research centres in Europe are amongst the most attractive places in the world to satisfy one’s scientific curiosities. However, there is no doubt that the USA remains, overall, more attractive than Europe for a young scientist looking for a postdoctoral position in research.

In our opinion, the crucial issues are: a shortage of funds for research; too much diversity and a lack of transparency in the national career structures, which precludes a European science job market; granting systems that do not operate international standards of excellence, an underdeveloped commercial sector carrying out research and development (R&D), and a lack



of appreciation of the role of scientists in society. Europe will have to address these important failings before it can hope to offer an environment for research that can compete with that already available in the USA and emerging in several developing countries.

As a continent, we invest too little in research and development (on average, slightly less than 2% of GDP). This shortfall is widely recognised by politicians. Of course, there are remarkable differences between countries: Sweden and Finland invest a lot more than 3%, whereas others invest less than 1% of their GDP. At the European Council of Ministers meeting in Barcelona in 2002 the heads of government of the European Union (EU)’s member states committed to investing 3% of their GDP in R&D by 2010. Most are very much behind sched-

ule. As scientists, we should be lobbying our politicians to make better progress towards this goal.

Yet, despite their heavy investments, Sweden and Finland compete poorly with the USA in attracting the best young sci-

tists. This is mainly because they are small countries with limited job markets; Europe is not yet perceived as a large open market in which to develop fully a scientific career. A young researcher faces dozens of different career structures and academic systems in the various countries, some of which are rather impermeable to new recruits, all accompanied by enormous differences in sal-

aries, tenure arrangements, social security systems, pensions, etc. The absence of a European market discourages our young scientists, and the best of them are easily attracted elsewhere.

Retaining our best researchers is one aspect of the problem but a failure to attract researchers from overseas is as important. The diversity in national work-permit legislation means that non-EU citizens wishing to come to work in Europe often have to overcome serious obstacles indeed. One urgent improvement is the introduction of an ‘EU scientific visa’, which will favour the mobility of non-EU citizens.

Another facet of the science job market is the commercial sector, which provides alternative career choices. Science-based businesses are expected to contribute a large proportion of the 3% investment goal set in Barcelona. It is important to design schemes that favour the mobility from academia to industry, and *vice versa*.

In the 11th century, the 24 students of the newly established University of Bologna (who came from all over Europe) complained of being mistreated and often ripped-off by innkeepers and landlords. The mayor of Bologna – realising the importance of educated people for the future of his city – made them guests of the city. Maybe this would be asking too much nowadays, but something ought to be done.

One important improvement would be to implement a European career structure for academics. The European Commission’s Marie Curie Programme and the ERC are already moving in this direction, but a common and clear pathway is still to be de-

veloped. A European tenure-track programme should be put in place for the most promising scientists. These positions should be assigned solely on the basis of the quality of the individual, and the selected candidates should be free to choose their host institutions. This new breed of tenure-track scientists should be given contracts like those of EU employees in Brussels or Stras-

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bourg. An important benefit of a common, Europe-wide career structure is that member states would be forced to improve the local conditions in order to recruit the best candidates.

Some would probably perceive the injection of visible and privileged new talent as a perturbation of the apparent calm of their institutions,

but we believe, on the contrary, that these European tenure-track sci-

entists would act as role models, stimulating the growth of their colleagues and improving their environments. Such a scheme needs funds, of course, some of which could be provided by increasing the EU's budget for research at the expense of national budgets. In the 21st century, science and technology should be equally as important as agriculture, if not more important. It is about time we privilege our future over our present.

Similar objectives of improving the general level of research by open competition and privileged reward is at the heart of the

ERC's philosophy and its mode of operation. The success of the ERC is crucially important for the scientific community, not only as a granting agency, but also for its value as an agent of cultural change. What drives scientists is, primarily, the sense of adventure and freedom that their careers can offer. Much of the USA's success is due to its

ability to create an environment that offers scientists exactly such a sense of liberty, particularly in the early stages of their careers. This is one important reason why the USA has been able to attract and retain our best students, formed at high cost by our national programmes.

Regarding the success of the ERC, the results of its first call for Starting Independent Investigator Grants deserve some comment. The 9,167 applications received reveal the hopes, needs and potential of young researchers in Europe. Since only around 300 grants will be awarded, however, the success rate will be a meagre 3%. Having created a good evaluation and granting system,

we now risk sending a negative message: Europe is not able to adequately sustain its science. An increase in the funds allocated to this programme is, therefore, crucial to establish our continent as an attractive place for curious minds. This would be possible given the increased resources agreed in Barcelona.

It is also important that individual member states join forces in implementing an effective EU career system. Care should be taken to favour mobility not only across geographical borders but also between academia and industry. For too long, these equally important tracks were kept apart due to concerns about possible loss of academic independence. We must break this artificial wall and recognise that interchange can only benefit our scientific and technological progress.

One argument against the idea of a harmonized European career is that the weaker states might end up contributing to the research of the states that already have a strong research base. In our opinion, however, this risk is much higher with too stringent a threshold. Moreover, when more

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good applications, deserving of funding, are rejected than those that are funded a terrible message is sent out to the scientific community.

Equally important is to promote postgraduate education towards a trans-national PhD degree. Previous top-down attempts to create a 'European PhD' failed because they collided with local interests. More encouraging results have been obtained with bottom-up initiatives, where groups of scientists have obtained EU funds to create networked PhD programmes: the degree is awarded by a single university, but the faculty are international, the selection procedures are transparent and the working environment is attractive. These schemes have set high standards that are slowly but surely influencing our national PhD schools.

Perhaps the most difficult problem to tackle is how to promote the visibility of science and the status of scientific careers in our society. Living in Milan, we are exposed to good football. True, some of our

research seminars are less exciting than a good game. Still, scientists are not good at promoting the value of science. The salary

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of one top football player would be enough for a research department to thrive on. Are we sure that as a community we recognise enough that a dramatic innovation in any field of science (imagine, for example, a new method for energy production) could have an enormous impact on our lives and the lives of future generations? Society must be

made more aware of the practical value of science, besides the cultural ones.

US tax laws encourage citizens and corporations to donate funds for research. This is not the case in most European countries. It seems clear that increasing public participation in research funding would not only ameliorate the overall budget, but also help to create a better perception of the role of the scientist. It might also convince many people that research is what created our good living standards, and remains our cultural destiny.

