

Is French science in decline...

...or have its failings been greatly exaggerated? Declan Butler finds out.

Se regarder le nombril — navel gazing — is a national sport in France, and that gaze has turned to science. The sentiment that French research is in steep decline has become a recurrent theme of political discourse, newspaper editorials and TV talk shows.

France's research system has its problems — from unwieldy bureaucracies to dilapidated universities. As a result, many gaze across the channel, and the Atlantic, to the Anglo-Saxon system as a model for science and innovation.

Key science indicators reveal a more complex picture, however. Despite deep funding cuts, basic research in France seems to be stable in terms of overall output of papers, but is losing ground in 'visibility' — the papers that have the greatest impact. The country does have a chronic weakness in private-sector research, though it is hardly alone in this malaise.

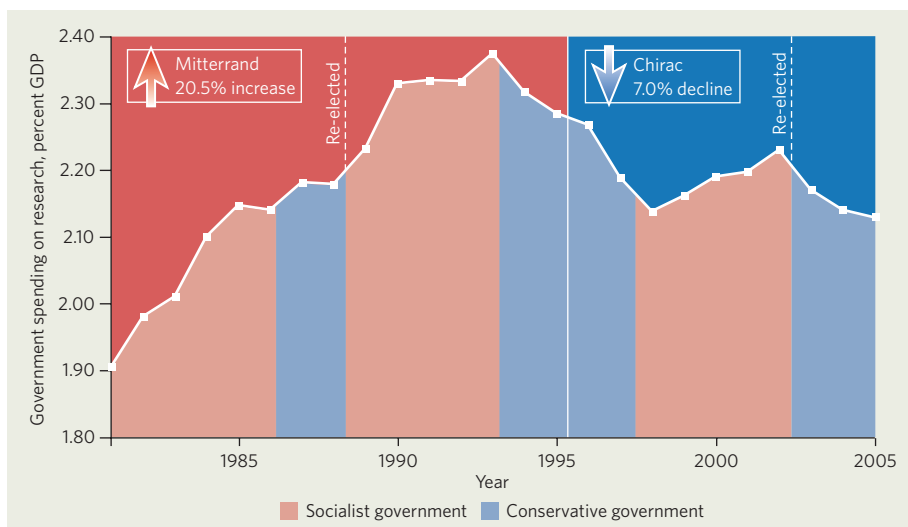
The challenge for French research in which politicians can make the biggest difference is the decline in government spending. Recent history reveals an 'accordion' effect in which right-leaning governments squeeze research funding, and socialist ones expand it (see graphic).

President François Mitterrand's election in 1981 marked the start of a golden decade for French research as spending grew rapidly under successive socialist governments. But the growth came to an abrupt end in 1993 when conservatives were elected under Prime Minister Edouard Balladur.

And spending has fallen further since Jacques Chirac was elected as president in 1995, albeit punctuated by a rise under socialist prime minister Lionel Jospin from 1997 to 2002. But the net result of Chirac's 12-year presidency is that spending on science was lower as a proportion of GDP in 2005 — 2.13% — than it was in 1985.

This decline runs contrary to the goal of raising average science spending from 2% to 3% of GDP by 2010, which EU governments agreed in Lisbon in 2000. Some smaller European nations have already reached this target, although they remain the exceptions. Britain and Germany are the two European countries most directly comparable to France in research power, and the three together account for two-thirds of all research in the European Union. So how does France compare to them?

Germany overtook France as Europe's larg-



"French basic science is still holding its own."
— Ghislaine Filliatreau

est research spender in 1997, and its budget reached 2.52% of GDP in 2003. In the decade 1993–2003, UK spending fell by 8.7% to 1.88% — a similar drop to that seen in France.

But France has done better than Britain in private sector funding. Between 1993 and 2003, industry funding grew by 8% — close to Germany's 9%. By contrast, Britain has seen a 15% drop over this period — by 2003, to just 44% of its total science spending, well below the EU average of 54%. At 51%, France is very much an average European player and still falls short of

Japan, where industry accounts for three-quarters of research funding, and the United States and Germany, where it accounts for two-thirds.

How does all this spending translate into research outputs? France's share of the world's scientific papers had reached 5.4% by 1999, but by 2004 it had dropped to 4.7%, at which point it was displaced from fifth place in the world league by China. A comparable drop has occurred in most European countries, including Germany and Britain, and in the United States. "This negative rate is directly related to a positive growth rate in several countries, especially China," says Henk Moed, an expert in science indicators at Leiden University in the Netherlands.

The downward trends in research outputs is most marked in France's share of patents, particularly in the important US market. France's share of US patents dropped by 14% between

1999 and 2004 to 2.5%, whereas the EU's share as a whole fell by just 2% over this period to 17.1%. As with scientific publications, part of this drop is down to emerging economies in Asia. North America's share of US patents fell by 3% to 49.9% during this time; Asia's share rose by 6% to reach 30.1%, and South Korea overtook France and Britain with 2.6% of all US patents.

Of all the indicators, few can hurt French pride more than having so few institutions in the top rankings of international universities. But the poor performance of French universities is perhaps also exaggerated.

Under France's complex system, most labs belong to one or more research organizations and a university, but automated indicators such as Thomson's Essential Science Indicators count only the first affiliation in an author address, which means that French institutions are often not attributed correctly. To tackle this disparity, Thomson started a project in February with the Paris-based Observatoire des Sciences et des Techniques (OST) to get a truer picture of French science.

So the figures, although no cause for complacency, are not as bleak as some of the rhetoric might suggest. "We shouldn't overdramatize the supposed decline," says Ghislaine Filliatreau, director of the OST, "French basic science is still holding its own, despite poor funding, but risks being outspent and outperformed by other countries."

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