

## Cold-war lessons for East–West science

**The fall of the Berlin Wall united Europe's scientists. But fractures remain.**

**O**n the night of 9 November 1989, young and old began to dismantle the Berlin Wall. Brick by brick, they broke down the 3.6-metre-high structure, which formed part of the border between communist East and capitalist West Germany. Those unforgettable scenes changed the world's political map. They led to Germany's reunification and played a significant part in the liberation of central and eastern European countries from the Soviet yoke and their subsequent entry into the North Atlantic Treaty Organization and the European Union.

Those were heady months. The political philosopher Francis Fukuyama excitedly called the expansion of western-style liberal democracy “the end of history”. But, as we now know, such a statement was not only premature, it also masked a much more complex reality of international relations that is still playing out today.

For scientists in central and eastern Europe, the end to more than four decades of isolation was a big win. More research transferred to universities, and away from the old, state-supported academies of science. With that came new sources of funding from the European Union – amounting to €25 billion (US\$28 billion) in the present round.

But the abrupt transition to a market economy, and the ending of many state subsidies for the less-well-off in former communist countries, also took their toll. Economic hardship in the early 1990s helped drive many researchers to pursue careers in the West. This exodus of academics contributed to an intellectual void, from which Russia and Ukraine, especially, haven't fully recovered.

But it was different for science institutions in western Europe, and more globally. Fresh ideas and new talent were welcomed. One result is the experimental fusion reactor ITER, developed by Soviet-era researchers in the late 1960s and now being constructed in France. The International Space Station is another.

But there's some distance to go before the scientific gains of an expanded EU can be more fully shared. Spending on research and development in central and eastern Europe averages at 1% of gross domestic product (GDP) – considerably below the EU average of 2.07%.

Some countries, such as the Czech Republic and Slovenia, have caught up in recent years. But others, including Romania, Bulgaria and Croatia, spend even less than 1% of their GDP on research and development. EU member states from central and eastern Europe that are home to one-fifth of the bloc's 500 million inhabitants gain less than 5% of the €80-billion Horizon 2020 research programme. This must change – and it will if national governments

start to ramp up their own domestic investments and work harder to improve the quality of their research.

One of the biggest paradoxes of the past 30 years is Russia. The epicentre of Soviet power, Russia under Mikhail Gorbachev in the mid-1980s began to look West, helping to precipitate the fall of the Berlin Wall. Today, the international atmosphere is closer to that of a new cold war. Russia and the EU, with the United States, are on opposite sides of crucial foreign-policy controversies, and both Russia and the United States are pulling away from key arms-control agreements, notably the Intermediate-range Nuclear Forces Treaty.

And although Russia remains part of many international scientific projects, in some cases it is choosing to seek scientific partnerships to its east and south, including with the BRICS countries – Brazil, Russia, India, China and South Africa – and with others in Africa, Latin America and Asia. A new divide seems to be opening up between researchers in the East and West.

If a new cold war is coming, the lessons from science's cold-war history need to be dusted down. US president Lyndon Johnson and Russia's premier Alexei Kosygin agreed that – other differences notwithstanding – their nations would collaborate in science. One result was the founding in 1972 of the International Institute for Applied Systems Analysis in Laxenburg, Austria, which is still going strong.

Among the larger EU states, Germany clearly understands the need to keep an open door for researchers, and remains actively involved with Russian research. A call for proposals for joint German–Russian projects in all fields of science, launched last month by the German Research Foundation and the Russian Science Foundation, promises to strengthen scientific links between the two countries. Russia's logistical support of MOSAiC, a German-led one-year Arctic expedition launched in September, highlights the feasibility of East–West scientific partnerships even in troubled political times.

Thirty years of research cooperation since the cold war ended has done much more than just help to keep the peace. But a strong dose of that original spirit – which kept cold-war collaborations alive – is still needed. The journey to successful East–West collaboration is far from over.



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## A cry for help

**Without systemic change to research cultures, graduate-student mental health could worsen.**

**T**wo years ago, a student responding to *Nature's* biennial PhD survey called on universities to provide a quiet room for “crying time” when the pressures caused by graduate study become overwhelming. At that time, 29% of 5,700 respondents listed their mental health as an area of concern – and just under half of those had sought help for anxiety or depression caused by their PhD study.

Things seem to be getting worse.

Respondents to our latest survey of 6,300 graduate students from around the world, published this week (see page 403), revealed that 71% are generally satisfied with their experience of research, but that some 36% had sought help for anxiety or depression related to their PhD.

These findings echo those of a survey of 50,000 graduate students in the United Kingdom also released this week. Respondents to this survey, carried out by Advance HE, a higher-education management-training organization based in York, UK, were similarly positive about their research experiences, but 86% report marked levels of anxiety – a much higher percentage than in the general population. Similar data helped to prompt the first global conference dedicated to the mental health and well-being of early-career researchers in May. Tellingly, the event sold out.

How can graduate students be both broadly satisfied, but also – and increasingly – unwell? One clue can be found elsewhere in our survey. One-fifth of respondents reported being bullied; and one-fifth also reported experiencing harassment or discrimination.

Could universities be taking more effective action? Undoubtedly. Are they? Not enough. Of the respondents who reported concerns, one-quarter said that their institution had provided support, but one-third said that they had had to seek help elsewhere.

There's another reason for otherwise satisfied students to be stressed to the point of ill health. Increasingly, in many countries, career success is gauged by a spectrum of measurements that include publications, citations, funding and impact. Early-career jobs tend to be precarious. To progress, a researcher needs to be hitting the right notes in regard to the measures listed above in addition to learning the nuts and bolts of their research topics.

Most students embark on a PhD as the foundation of an academic career. They choose such careers partly because of the freedom and autonomy to discover and invent. But problems can arise when autonomy in such matters is reduced or removed – which is what happens when targets for funding, impact and publications become part of universities' formal monitoring and evaluation systems. Moreover, when a student's supervisor also gets to judge their success or failure, it's no surprise that many feel unable to open up about vulnerabilities or mental-health concerns.

The solutions are not solely in institutions doing more to provide on-campus mental-health support – as essential as such actions are. They also lie in recognizing that mental ill-health is a consequence of an excessive focus on measuring performance – something that funders, institutions, journals and publishers must all take responsibility for.

Much has been written about how to overhaul the system and find a better way to define success in research, including promoting the many non-academic careers that are open to researchers. But on the ground, the truth is that the system is making young people ill and they need our help. The research community needs to be protecting and empowering the next generation of researchers. Without systemic change to research cultures, we will otherwise drive them away.



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## South Africa's rooibos restitution

**Indigenous groups must be compensated for their knowledge and made equals in research.**

**N**ine years. That's how long it took representatives of South Africa's rooibos tea industry to agree to compensate the Indigenous San and Khoi communities for their contribution to the development of the 500-million-rand (US\$33.6-million) industry.

It is a landmark agreement, but it should not have taken so long to complete. One important lesson researchers should take from it is that there are more harmonious ways to collaborate with Indigenous communities.

San community representatives first wrote to South Africa's government in 2010 arguing that, under the law, they are entitled to a share in the tea industry's profits because it had used their traditional knowledge.

The communities felt they had a good case: the rooibos plant (*Aspalathus linearis*) is endemic to South Africa's Cederberg region, which was inhabited by San and Khoi communities long before settlers from Europe forcibly took their lands. The government commissioned a review of the historical and ethnobotanical literature, which concluded that there is a strong probability that rooibos tea had Indigenous origins (see [go.nature.com/2rqjei3](http://go.nature.com/2rqjei3)).

The industry argued that there is little published scientific evidence that explicitly states that the ancestors of today's San and Khoi communities were the first to brew rooibos teas. It commissioned its own study (see [go.nature.com/2q0poyk](http://go.nature.com/2q0poyk)), which supported its side of the argument.

Two studies reviewing essentially the same historical literature and coming to different conclusions is not unusual. But however the research is interpreted, there's a moral case to compensate long-mistreated groups. The government advised the tea industry that it needs to pay the communities, which will receive 1.5% of the 'farm gate price' – that paid by agribusinesses for unprocessed rooibos.

What Indigenous communities are most concerned about is the fact that research and industry have the ability to access traditional knowledge without sharing the credit or the potential benefits with those who generated it. That was the motivation, two years ago, for the San communities' production of a code of research ethics (see [go.nature.com/32v0xom](http://go.nature.com/32v0xom)). The code urges scientists to follow through on promises to share publication credit and, where possible, to build capacity for Indigenous groups to do their own studies.

The ethics code and the rooibos agreement are small steps towards a bigger demand: that Indigenous people, especially those whose ancestors lost lives, land and livelihoods during more than a century of exploitation, are treated fairly and as equals by research and industry.