Scientists, academics and environmentalists in Brazil have been raising the alarm about Bolsonaro's environmental policies — as well as his anti-democratic leanings — for months. But his vitriol and fiery rhetoric carried the day. Bolsonaro captured 55% of the vote in the second round of the election on 28 October against Fernando Haddad, former mayor of São Paulo and political scientist who became the Workers' Party candidate only after the jailed — but still popular — Lula was barred from running. There are many reasons to worry — for people both inside and outside the country.

A former army captain and long-time legislator from Rio de Janeiro, Bolsonaro has earned his 'Tropical Trump' moniker by denigrating women and minority groups, threatening to take land away from Indigenous communities and declaring he would prefer his son to be dead rather than gay. His solution to the epidemic of violence is to put guns in the hands of citizens — and make it easier for police to use lethal force. He speaks fondly about the military dictatorship that ran Brazil from 1964 to 1985, and his vice-president, Hamilton Mourão, a former army general, has openly discussed the possibility of military intervention to quell the political chaos that has reigned during the past few years. His election is another blow for those who value free thinking and free expression.

Bolsonaro's position on science and the environment is just as worrying. He promotes development at all costs and has at times threatened to follow US President Donald Trump and pull Brazil out of the 2015 Paris climate accord (although two days before the election, Bolsonaro said Brazil would stay in). He has promised to merge the environment ministry — the function of which includes the protection of the Amazon rainforest — with the agriculture ministry. Regardless of whether he can get such changes through the Brazilian Congress, his election sends the wrong signals to landowners and businesses who hold considerable sway over the future of the largest tropical rainforest on the planet — and the carbon that it contains. Globally, deforestation produces around 10% of greenhouse-gas emissions.

The tale of Bolsonaro's rise to power is by now sadly familiar. He unleashed incendiary anti-establishment rhetoric that spread like wildfire on social media and found fertile ground with a legitimately angry populace. Brazil is still recovering from a crippling two-year recession that began in 2014, and the country is reeling from ongoing investigations into political corruption. The Brazilian public's desire for change is entirely justified, but Bolsonaro is no saviour. He represents the biggest test yet for Brazil's young democracy, and academics will soon find themselves on the front line fighting for evidence-based policies. They have allies. His environmental agenda will face intense domestic and international opposition — including from many powerful beef and soya-bean exporters that do not want to deal with the stigma of deforestation. Scientists everywhere should add their voices to the protests.

"The tale of Bolsonaro's rise to power is by now sadly familiar."

On the same day that Bolsonaro announced his reversal on the Paris accord, Brazilian media reported that police and election authorities had conducted raids on at least 17 universities, questioning students and academics about illegal election activities — the law prohibits electoral publicity in public spaces. The authorities apparently seized protest materials, including pro-democracy and anti-fascist banners and flyers.

Brazil's budgetary woes have meant that researchers have struggled for years to fulfil the nation's potential to be a scientific giant; the federal science ministry's budget is now roughly one-third of its 2010 level, and further cuts are expected next year. Luiz Davidovich, a theoretical physicist and president of the Brazilian Academy of Sciences, has said that conducting research in Brazil is "an act of resistance". That resistance will be even more crucial when Bolsonaro takes the helm. ■

First steps

People paralysed by spinal injuries are being helped to walk again.

Not so long ago, the hope that someone paralysed for years by a severe spinal-cord injury would ever be able to walk again was just that — hope. But recent advances are bringing those hopes closer to reality.

In this week's *Nature* (page 65), researchers describe a treatment — a combination of electrical stimulation of the spinal cord and physical therapy — that has enabled three men with spinal-cord injury to walk (F. B. Wagner *et al. Nature* **563**, 65–71; 2018). And this is not just in controlled laboratory conditions: they have been able to take walks outside again.

It's an extraordinary development that could have implications for hundreds of thousands of people around the world. And it's also the result of decades of cross-disciplinary research that has steadily built an evidence base in animal experiments — with the scientists involved sometimes facing criticism for doing them — and taken that work carefully into the clinic.

Researchers have long pursued diverse strategies to repair and reactivate the spinal cord after injury. Many approaches are remarkably effective in regenerating and achieving functional recovery in mice and other animals, but fail to translate to human therapies. The advance in the current study was that, rather than delivering a constant electric current — as had been tried before — the researchers applied patterns of stimulation calculated to activate the correct groups of leg muscles at the correct time during stepping. In this way, specific locations in the spinal cord could be targeted, to activate the muscles in a coordinated fashion. This patterned stimulation protocol not only allowed the unprecedented restoration of walking ability, but also enabled the individuals to regain control over previously paralysed muscles when electrical stimulation was turned off. This indicates that the brain and spinal cord had re-established functional connections, revealing an unexpected degree of plasticity.

In light of such progress, the prognosis for what was long considered an irreversible condition seems a lot brighter. But there is much more work to do. Spinal injuries vary enormously in their location, severity and outcome, and it will take many more studies to understand who will benefit from this technology. The current research is a proof of concept in a small number of participants who had a range of residual leg function at the start of the study. A major challenge is to understand what determines successful recovery. For example, one source of variability might be how much sensory information the damaged spinal cord can still transmit to the brain.

In a related study published this week in *Nature Neuroscience*, the same team shows that continuous stimulation (which is enough to restore locomotion in rodents) is less effective in humans because it interferes with the transmission to the brain of sensory feedback about an individual's own movements and body position (E. Formento *et al. Nature Neurosci.* https://doi.org/10.1038/s41593-018-0262-6; 2018). This is another reason why temporally patterned stimulation could be more effective, and might have been one key to success for the three participants in the *Nature* study. However, different stimulation methods might turn out to be more or less useful for different individuals.

It's also important to temper this exciting success story with caution about access. According to the World Health Organization, between 250,000 and 500,000 people around the globe are affected by a spinal-cord injury each year — most caused by road accidents, falls or violence. Spinal stimulation is a complex and expensive medical procedure, and recovery also seems to require intensive rehabilitation. It will not be available to all — at least, any time soon. But it is a first step. ■