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Political wisdom

Donald Trump should heed convention and resist crippling the National Institutes of Health — a move that would cause immense damage to US research.

Conventional political wisdom says that it's best to be seen to be protecting common goods such as medicine and health. So US President Donald Trump is certainly shaking things up. Most scientists probably feel a little more than shaken up, given the slash-and-burn approach that the president signalled towards research in his draft budget proposal last week. The headline reductions give the unfortunate impression of a fire sale of the US government's knowledge base: 31% off the Environmental Protection Agency! 20% off the Department of Energy's Office of Science! More big savings to come!

Of the signalled cuts, it's the headline 18% reduction in the spending power of the National Institutes of Health (NIH) that is dominating the agenda. As this journal has pointed out before, the idea that funding — for biomedicine or any other pursuit — leads directly to discovery in a neat and proportionate linear fashion is simplistic, and one that researchers should reassess before they promote it too eagerly. But politics thrives on simple messages, and so the headline writers have had a field day: cancer and other diseases will claim more lives if this cut goes ahead.

Trump and his team would have expected this, of course. It's Congress that makes the fiscal decisions, and even a Republican-dominated legislature will find it difficult to endorse such serious cuts — and severe damage — to the NIH, which has previously been a cross-bench cause. That's a common play of any White House: hand Congress an unpopular budgetary proposal, watch it scramble to find the money to fix the problem — in this case, to restore as much NIH funding as possible — and then sit back while Congress, not the Executive Office, takes the flak for cuts it must then make to something else.

As we reported last week, scientists are furious about the proposals, and anxious about what comes next. There is no sign yet, for example, of what Trump plans for the National Science Foundation. They are right to be concerned. Trump's team calls its budget a blueprint, but it is closer to a demolition order. It's a scheme to cast aside expertise and dismantle evidence-based approaches to real-world problems, and, if followed through, would do untold damage to science and research in the United States. Climate change will become more difficult to monitor and tackle, greater amounts of damaging pollution will go unchecked and, yes, more people will probably die of cancer and other diseases.

Since the end of the Second World War, successive occupants of the White House have worried about the waning dominance of US influence on the world stage, and have invested in world-class science to try to stay ahead on many fronts — innovation and quality of life among them. President Trump seems willing to surrender US leadership without a fight.

What happens now? More budget details from the White House are due in May, and deliberations in Congress are supposed to be completed in time for a new arrangement to come into force in October. Much will depend on the relationship between the president and the Republican Party — and how astutely (or not) Trump's team has judged the party's response in Congress.

The pessimistic view is that Congress will restore some (but not all) of the NIH money and nod the rest of the cuts through. This would allow Republicans and Trump to both claim victory, but would still leave the agency facing a crippling funding reduction. Make no mistake: that would be a disaster for US science, for scientists everywhere — and for everyone who believes and hopes that research can help to make a better world.

An optimist might see it differently. Trump's attack on the NIH could be a step too far from an administration that has lost touch with its political base. A backlash could force a retreat and increase resistance to other attacks on science. Certainly, the administration is already struggling to justify its hostility towards US health-care research. At a press briefing late last week, Mick Mulvaney, the director of the Office of Management and Budget, was asked to justify the cuts. He said: "If you took over this as a CEO, and you'd look at this on a spreadsheet and go, why do we have all of these facilities — why do we have seven when we can do the same job with three, won't that save money? And the answer is, yes."

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Actually, it's a bit more complicated than that. And conventional political wisdom would tell him so. ■

Science surrogates

Trump's pick to head the FDA will bring experience — and industry ties.

Last Friday, many people at the American College of Cardiology conference in Washington DC crammed into a room to hear one of the most widely anticipated talks of the year. The data, as expected, showed that a potential blockbuster cholesterol medicine lowers the risk of heart attack and stroke — more than a year after it was approved by US regulators.

The drug, called Repatha (evolocumab), inhibits a protein known as PCSK9 that helps to control cholesterol levels in the blood, and it reduces 'bad' low-density lipoprotein (LDL) cholesterol by 57% in clinical trials (D. J. Blom *et al. N. Engl. J. Med.* **370,** 1809–1819; 2014). Yet cholesterol is merely an easily measurable proxy for the outcomes that patients actually care about — will this drug prevent disease and save lives?

An over-reliance on surrogate measures such as cholesterol levels has occasionally led medicine in the wrong direction, but their use in clinical trials is sometimes a practical necessity. Measuring

cholesterol involves a simple lab-based test performed on blood samples collected over a few months; by contrast, to determine whether a drug staves off heart attack and stroke requires regular assessments of thousands of patients for several years. (The Repatha trial enrolled around 27,500 patients and began in 2013.)

Deciding to use a surrogate or not requires judgement that pits the need for a speedier and cheaper drug approval against the need for scientific rigour. US President Donald Trump's nominee to head the US Food and Drug Administration (FDA), Scott Gottlieb, has made it clear that he thinks the agency should place greater value on speed. If the US Senate approves his appointment, in the future, more drug approvals might be made on the basis of surrogate endpoints.

This is not the only reason that many corners of the pharmaceutical industry breathed a sigh of relief on news of Gottlieb's nomination last week. For months, rumours circulated that Trump would put forward someone who would advocate a dramatic shift at the FDA, favouring a system in which the agency approves drugs on the basis of safety without regard for whether they work. This, along with Trump's proclivity towards proposing agency heads with little to no experience — and sometimes even an expressed desire to undercut the agency that they will lead — worried pharmaceutical executives and consumer advocates alike.

From that perspective, Gottlieb is a safe choice. He is a physician who worked at the FDA as a deputy commissioner under former president George W. Bush. He favours speedy drug approvals, but does not advocate dismantling the entire regulatory edifice. Similar to Trump, Gottlieb opposes the health-care reform enacted by former president Barack Obama, but he tends to back up his arguments with data — a refreshing approach in an atmosphere that is brimming with vague, ideological attacks.

Gottlieb may well prove to be an effective FDA commissioner. But in the midst of the relief over his nomination, it is important not to overlook a few other aspects of Gottlieb's CV. He received more than US$400,000 from the pharmaceutical industry between August 2013 and December 2015, and has worked as a venture capitalist for a firm that has invested in dozens of biotechnology companies.

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In his previous role at the FDA, Gottlieb removed himself from decisions that trod directly on his industry ties. In 2005, for example, he withdrew from discussions about the potential response to an outbreak of avian influenza in the United States, citing his past connection to companies that may be involved in the response.

He will probably take the same step as FDA chief. But it becomes more difficult to ensure that Gottlieb's ties to industry will not influence his decisions on broader issues. Would he also have to excuse himself from making decisions about when to use surrogate endpoints instead of more complete clinical data? What about guidance on how far the pharmaceutical industry can go to advertise drugs for unapproved uses? The cases that come before Gottlieb may not involve the companies that he has had dealings with, but they could have a tremendous impact on the industry as a whole.

Gottlieb's ties do not automatically mean that he will put pharma before patients, and there are benefits to an FDA chief who is familiar with all aspects of drug development. But Gottlieb's potential conflicts also mean that his leadership would — and should — be watched closely to ensure that he does not serve as a surrogate for industry interests. ■

Birds of play

New Zealand parrots are the latest to demonstrate the infectious power of emotion.

Before crowds were considered to show wisdom, they were feared to exhibit madness. Naturally, it was a journalist, Charles Mackay, who first seeded popular concern about the frenzied and irrational actions and beliefs of the mob in his 1841 book *Extraordinary Popular Delusions and the Madness of Crowds*. Alchemy, ghosts and — most enduringly — economic bubbles, were among the topics that Mackay sets up as crowd-sourced bad science, which he then skewers with glee and wit.

Further removed from the madding crowd was the French polymath Gustave Le Bon, who tried to place the roots of collective behaviour not in delusion but in infection. He had a serious motive — the French political and intellectual elite wanted to understand crowds so that they could control them better to preserve social norms — and in his 1895 work *Psychologie des Foules* (*The Psychology of Crowds*), Le Bon suggested a serious cause: emotions could propagate and spread between people in the same way as germs. The result of this crowd psychology, Le Bon concluded, still fell some way short of wisdom. Instead, the likely result of all this anger and fear passed around among vulnerable human hosts, he said, was the surrender of the capacity of the individual within a large group to act rationally. The psychology of crowds that Le Bon wanted society to focus on was mass panic.

More than a century on, Le Bon might be surprised that a popular modern interpretation of his idea aims not to avoid such emotional contagion, but to harness it. It seeks to do so to build links between people and to cement in place the kinds of social structure the French were so eager to preserve by keeping the infection at bay. Today, books and articles on management, teams and leadership typically draw heavily on Le Bon's theory of how human emotion and behaviour can be passed on in this way. And, they claim, this (largely subconscious) process can be understood and exploited to build relationships, foster team spirit and increase sales and profits.

Mackay would probably enjoy skewering those ideas, too. Emotional contagion — like much of social psychology — is an idea so simple and appealing that it's too good for many people to check before they reach for it to explain and try to steer human behaviour. There is a solid core of empirical data and theoretical mechanisms to support, say, the idea of contagious yawning (though even that has been questioned recently: see R. Kapitány and M. Nielsen *Adapt. Hum. Behav. Physiol.* http://doi.org/b4kf; 2017), but there are obvious problems with trying to project the principle too far. If contagious emotion is a replicative process, for example, then why is fear a common response to anger, and why do I fail to copy your envy, jealousy or grief? (see G. Dezecache *et al. Trends Cogn. Sci.* **19,** 297–299; 2015).

As counter-intuitive as it sounds, one way to analyse the reality and limits of emotional contagion is to look for it in animals. Some studies suggest that rats at play make noises that encourage others to join the fun, and that budgerigars copy each others' yawns and stretches.

This week, scientists report that New Zealand parrots can spread positive emotion, too — or at least behaviour that could indicate their state of mind. The researchers recorded the play calls of keas (*Nestor notabilis*) and played them back to groups of wild keas. When the birds heard the sounds, they played more vigorously and longer — certainly more than when they heard the calls of a South Island robin (*Petroica australis*).

The calls did not, however, seem to act as an invitation to join existing birds at play. Some keas that heard them preferred to start their own play — typically embarking on feats of aerial acrobatics. With self-confessed anthropomorphism, the scientists suggest that the play calls of these birds act in the same way as infectious laughter in people (R. Schwing *et al. Curr. Biol.* **27,** R213–R214; 2017). In its homeland, the playful kea is called the clown of the mountains. And as every good clown knows: cry and you cry alone. But laugh and the world laughs with you. ■