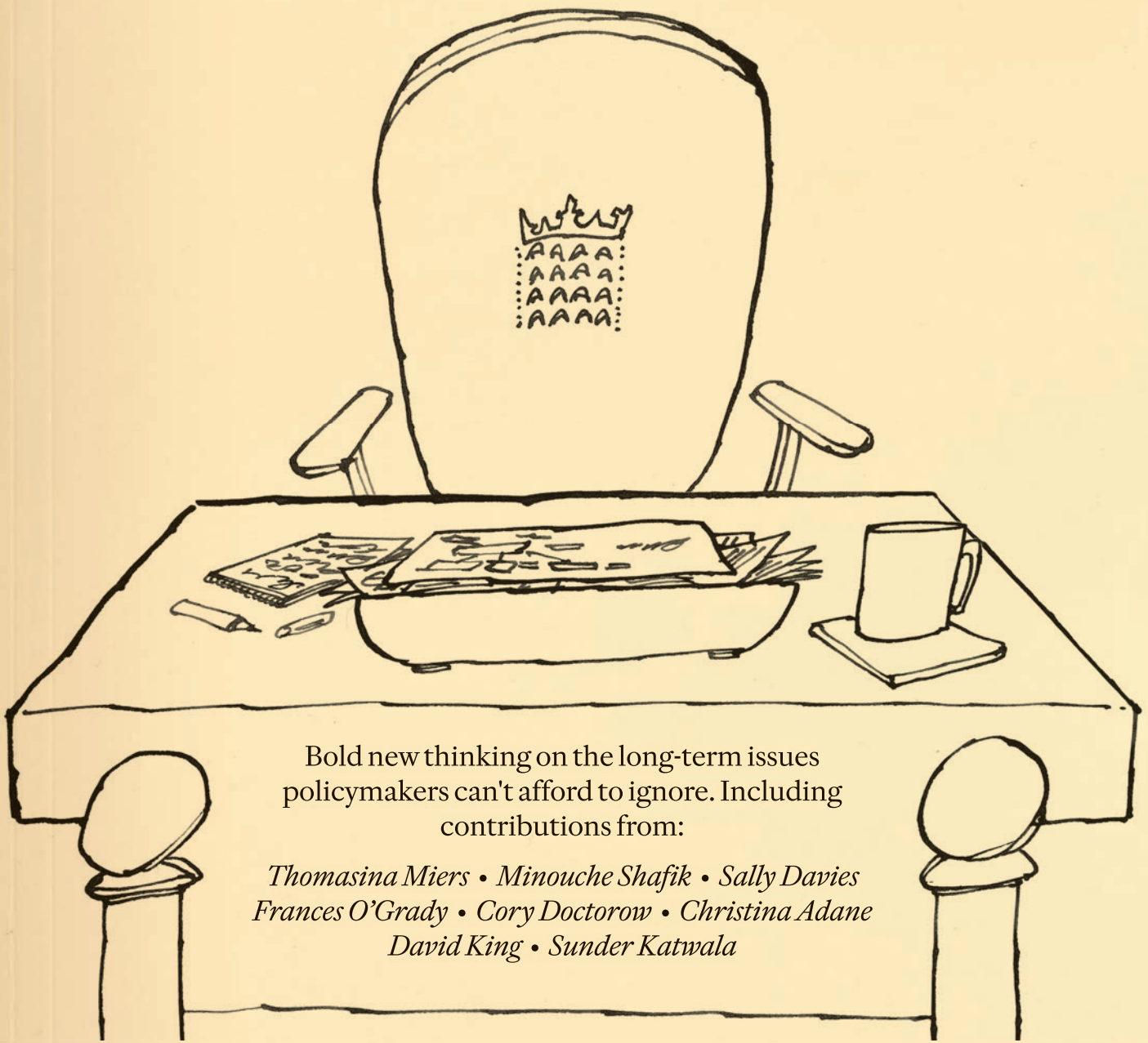


MINISTER FOR THE FUTURE



Bold new thinking on the long-term issues policymakers can't afford to ignore. Including contributions from:

*Thomasina Miers • Minouche Shafik • Sally Davies
Frances O'Grady • Cory Doctorow • Christina Adane
David King • Sunder Katwala*

Foreword

Imagine you are the Minister for the Future. Although your colleagues around the cabinet table are distracted by the latest crisis, you have been given a remit to look at the technologies, social trends and geopolitical shifts coming over the horizon. With this special report, *Prospect* and Nesta have brought this thought experiment to life.

Beneath the conceit lies a serious point. Political attention is fixated on managing the present. Political discourse, on the left and right, is often backward looking. Politicians rarely grasp the fundamental changes in science and technology, or culture and values, that are reshaping our lives. When they do, change is presented as a question of adaptation rather than of something we can actively shape.

At Nesta, we are focused on designing and testing long-term solutions to society's biggest challenges, from net zero to childhood inequality to public health. This collection delves into the wider forces that are set to change our society, economy and environment, each tackled by contributors with deep expertise.

For its part, *Prospect* has always championed bold ideas, especially those that cut across the political divide. In our first editorial back in 1995, we set out our stall for the magazine as "a home for those writers who see further into the future than the rest of us." A quiet space for pluralism in a loud world.

The great social and physical infrastructure projects of the past were sparked by an initial idea. We hope that this collection contains the seeds of such inspiration, leaving you feeling that the future is more malleable than some might fear and providing grounds for sober optimism.

Ravi Gurumurthy is chief executive of Nesta and Alan Rusbridger is editor of Prospect

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MINISTER FOR THE FUTURE



INTRODUCTION

From the Nesta project team

In 1858, Londoners were baking in a hot summer, just as they did this year. But while the soaring temperatures of 2022 fuelled anxiety about climate change, that summer focused minds on a different crisis of human making. The smell emanating from the open sewers of the city and the polluted Thames—dubbed the “Great Stink”—had finally become intolerable, even for the politicians in Westminster. Plans were hurriedly approved for that feat of Victorian engineering, Joseph Bazalgette’s sewers, an investment which subsequently prevented countless deaths from waterborne diseases such as cholera.

This remarkable legacy is an illustration of how acts of long-termism can bestow massive benefits on those generations that follow. But it is also a reminder that humans are almost always slow to take action without a trigger, like a moment of crisis or collective trauma. Take Rab Butler’s 1944 Education Act, which raised the school leaving age and outlawed fee paying at state schools, or the creation of the NHS. Both came about in the wake of the Second World War which exposed threadbare state provision.

The logic of inaction

It should come as no surprise that sweeping reforms are generally enacted on a burning platform.

Such triggers act like the outermost tentacles of some dim future reaching through the veil, imposing an immediate cost for inaction.

Classically, long-term problems prove tricky to grip because, according to the Institute for Government, they tend to share a set of thorny traits in common. Almost always politically or intellectually contested, such problems span multiple parts of government—while the costs and benefits are dislocated in time. That means paying upfront for future benefit.

These factors often conspire to make doing *nothing* actually appear logical. Most politicians know that, as a first mover, their intervention is bound to be suboptimal—destined to become a “lessons learned” case study for those that follow. Easier, then, to simply sit, like the frog, in the pot of slow-boiling water.

Short-term by design

This trap goes some way towards explaining how those who govern us came to inhabit a “reactive” state, jumping only when the heat becomes intolerable. But there is more to the story, not least the ever-growing supply of urgent crises threatening to overwhelm our cognitive bandwidth. The economic and political volatility of recent years has given rise to a collective condition

that is perhaps best expressed by the Collins Dictionary word of 2022—“permacrisis”.

Against this backdrop, policymakers could be forgiven for feeling like they have precious little time for over-the-horizon thinking. In their work on scarcity, US academics Eldar Shafir and Sendhil Mullainathan noted that time scarcity has the effect of capturing decisionmakers in “firefighting traps” where they focus on the urgent at the expense of what is more important over the long term.

If the human mind plays a part, then so too does our (unwritten) constitution, which prioritises today’s taxpayers while lacking the mechanisms to bind us to long-term commitments. Policy “solutions” to long-term challenges regularly end up passing along costs to younger or future generations, often in the form of government debt. It is bias towards the present such as this that prompted the philosopher Roman Krznaric to talk of “the tyranny of the now”.

If it feels like we are staggering from crisis to crisis, it is not by accident or quirk of the system, but because our model incentivises governments to kick the can down the road on the big issues of our era—from deep demographic shifts to food insecurity.

Ironically, Whitehall is replete with rigorous analysis, horizon scans and future scenarios shedding light on the road ahead. Partly thanks to the

pioneering efforts of the Government Office for Science, policymakers now have an increasingly sophisticated array of methods for anticipating and articulating the impact of future trends, wild cards and Black Swan events.

But the problem comes in putting the theory into practice, not to mention making it politically palatable. When confronted with one of the “wicked problems” of the 21st century, the average policymaker likely knows enough systems theory to be fearful of unintended consequences. Complexity thus induces paralysis.

But the UK is far from alone in grappling with this. Governments across the world suffer from a bias towards the present. Encouragingly, growing awareness of this bind has sparked a wave of experiments seeking to embed futures into institutional decisionmaking.

Locking in the long view

It is only right to acknowledge the debt this wave of experimentation owes to fiction writers, who have regularly grappled with the future as a political project. In 2005 the author Kurt Vonnegut lamented that there had never been a Cabinet Secretary for the Future, while Kim Stanley Robinson’s book *The Ministry for the Future* follows an international organisation of that name tasked with addressing climate change. But writers such as Vonnegut and Robinson have been joined in such imaginings by a host of real-world agitators seeking to tilt the balance in favour of future generations.

One approach gaining ground is the strategy of creating a body or a role (not unlike our own minister) with responsibility for future-facing action. In 2015, Sweden tasked a minister with temporary responsibility for future challenges, while Finland has long had a Parliamentary Committee for the Future. Back in the UK, the Welsh government appointed their own future generations commissioner in 2016.

Elsewhere, the judicial system has been the site of efforts to counteract

the short-termism of parliaments, often to safeguard the environment. In 2021, Germany’s highest court issued a ruling asserting that the country’s climate change laws violated fundamental freedoms by shifting the burden of curbing emissions to the young.

There have been novel moves to “measure” the intergenerational fairness of policies. The School of International Futures recently developed a framework to help civil servants test whether policies are fair to future generations, which has since been adopted by the Portuguese president Marcelo Rebelo de Sousa.

At Westminster the question of intergenerational fairness has been taken up by crossbench peer John Bird, who has been championing a Wellbeing of Future Generations Bill for the UK. Among other duties, the bill seeks to establish a Joint Parliamentary Committee on Future Generations and would require public bodies to publish future generations impact assessments.

There will never be a panacea for chronic short-termism, given the strength of the institutional and cognitive biases which underpin it. Yet this patchwork of experiments does hint at a sea change in attitudes, as well as a growing appetite to think more systematically and ambitiously about governing in line with a nation’s future interests.

To these experiments we add our own Minister for the Future; a blank canvas upon which more ambitious ideas or projects can be projected. The very act of creating permission for such

thinking in mainstream policy discourse helps to shift the Overton window—or the policy “possibility space”—which has become gradually more restrictive as successive crises fatigue us.

The minister’s inbox

We’ve chosen eight themes that would dominate any real Minister for the Future’s inbox. While far from comprehensive, the collection offers up a cross-section of the kinds of trends, technologies and cultural shifts which will loom large on the policymaking horizon in coming decades.

This uncertain landscape is littered with both risks and opportunities for the UK, especially as these dynamic trends start to interact unpredictably. A case in point: how can we plan for a labour market simultaneously rocked by the aftermath of Brexit, the green transition and automation? Although some hold out hope that the latter will unlock productivity growth, in practice many workers will struggle to adapt to this brave new world without support.

To fill up the minister’s red box with actionable ideas, we’ve assembled world-leading academics, scientists, campaigners and business leaders alongside many who have spent time at the heart of government. Together, they bring deep expertise, a dash of leftfield thinking and unique insight into the way these challenges are likely to unfold.

Pluralism is at the heart of this undertaking. Over time, too much airtime has been given to just a handful of Silicon Valley technologists and billionaires with visionary schemes for the advancement of humanity. Because there are no simple solutions to such multifaceted challenges, you’ll also find several proposals for every topic.

The intent is that these contributions stimulate, provoke and inspire. To that end, we invite you to look beyond the permacrisis of the current moment, and pull up a seat behind the minister’s desk.

Celia Hannon is the director of discovery at Nesta. Rees Howell is a writer and policy adviser. Laurie Smith is head of foresight research at Nesta



There will never be a panacea for chronic short-termism, given the strength of the institutional and cognitive biases which underpin it

BETTER THAN WELL

Biomedical science and new technologies promise extraordinary advances in the treatment of disease, but how can we ensure that future gains in health are widely distributed?

Advances in medical science promise new leaps forward in human health and longevity. But how widely will these benefits be shared? The potential of technological innovation is dazzling, but a policy focus on the wider determinants of health is likely to prove as, if not more, important in shaping the quality of life of our population.

When Covid-19 struck, medical science took centre stage: new technologies enabled the rapid sequencing of millions of cases, while pioneering RNA research facilitated the creation of new vaccines. Similarly impressive developments are now becoming commonplace across a range of frontiers. Some notable breakthroughs in the last few years include the AI-based AlphaFold protein database (which should equip life science researchers with powerful tools for understanding disease and drug discovery) and brain-computer interfaces (which could have a range of applications, including for those recovering from spinal injuries).

The UK's life science industry is well-positioned to be an important economic asset in the years ahead. Last

year the sector attracted £4.5bn of investment, compared to just £261m in 2012. The research and development potential is considerable if the UK can successfully combine the strengths of its universities with the unique opportunities for clinical trials and data collection afforded by a centralised health system like the NHS.

Yet scientific innovation and “MedTech” alone will not deliver better health and longer lives, as uneven access to the benefits of any new breakthrough could serve to simply entrench health inequalities over time. In practice cutting-edge treatments could prove costly. The NHS may struggle to meet demand alongside continuing to invest in preventative healthcare. Policymakers have long struggled to find effective levers to tackle the wider social and environmental causes of disease, as the long-term effects of factors—like air pollution—are often hidden from view.

If medical science holds out the promise of rapid innovations in the treatment of disease and extension of healthy life, how might we ensure these benefits are widely distributed? Among the ideas for the minister's

attention here is James Kirkland's proposal for an international Cern-like institution to power scientific discoveries on age-related diseases. Off the back of the pivotal work in mapping the human genome, Tina Woods argues we now need to map the so-called “exposome” which tracks the environmental causes of disease. Finally, and perhaps most ambitiously, Sally Davies offers up a vision for a National Health Bank focused on preventative measures to safeguard the nation's most vital asset—the health of its population.



A National Health Bank to invest in prevention

Sally Davies



Health is fundamental to everything. I propose that we start valuing it.

Our tendency to undervalue personal health is problematic at an individual level, but it is frankly unfathomable at the societal level, where we still view health through the lens of its absence.

It's in baffling contrast to how Whitehall would balance the books on, say, defence or finance: what a banker might call "value" or an admiral "strategic reserve". We have neither the right language nor the metrics for health. This shows just how far our thinking is skewed only to the illness side of the equation, the losses column.

In the future we need to think about health—our *total health*—as a strategic national asset, to be measured, protected and grown. This requires new metrics that properly capture the overlapping drivers of health. But it also means a shift in philosophy that allows us to think about prosperity as the sum of wealth and health. After all, who would consider a billionaire on their deathbed as prospering?

But to really value health we *should* learn from the banks, especially central banks with their role as both regulator and long-term steward. With this in mind, I propose a National Health Bank (NHB), inspired by the Bank of England. Where the NHS has become focused on illness, the NHB would invest in strengthening the UK's net present health—funding only the interventions that promise the best health returns on its investment.

Like all central banks, the health bank will have a powerful role in regulating market players—holding sway over a pay or play system where bad health actors will have to contribute financially to offset their activity. This will fill its

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In the future we need to think about health—our total health—as a strategic national asset

coffers, enabling our bank to play its stewardship role, not as a lender of last resort, but as an investor of first resort; funding prevention, not cure.

In controlling a major health fund, the health bank will be able to take the long view and invest in the community and medical initiatives that will strengthen overall health resilience across the UK. But to do this, it needs scale. So, simultaneously, I propose we also introduce a flat 1 per cent inheritance tax ringfenced for this fund (not the NHS!). A universal paying-it-forward would create a financial force to make possible the interventions and research that will deliver longer, healthier and happier lives.

Sally Davies is a professor and master of Trinity College and former chief medical officer for England

We need a Cern-like effort to power an extension in healthy life

James Kirkland



We should celebrate people living longer, but the promise of longevity can only be fully realised if those years are healthy.

Disability-free life expectancy (i.e. the number of years that a person is expected to continue to live in a healthy condition) is falling in the UK, creating new challenges for individuals, society and public services. We are ageing too young and our health-span isn't keeping up with our lifespan.

Ageing itself is complex. It's a lifelong process, starting before birth and is vital to life and development. So, the science of ageing isn't the pursuit of longer life; it's about helping us live free of disease for longer.

Thanks to decades of research, we know much more about the effects of ageing. This could open a door to a new field and perhaps jumpstart a revolution in medicine similar to that driven by the development of antibiotics. We are starting to see exciting treatments that delay, alleviate or even partially reverse age-related diseases like dementias, arthritis, cancers, and heart disease.

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We are starting to see exciting treatments that delay, alleviate, or even partially reverse age-related diseases

Recently we have seen a flurry of clinical trials of senolytic drugs that target "senescent" (worn out) cells which can cause disease. And there are now plans for a study to determine whether the diabetes drug metformin might delay the development or progress of many age-related diseases.

Rather than treating diseases simply on an individual basis, this new class of interventions represents a way to tackle the root causes of *multiple* diseases simultaneously. But we will also need to manage expectations. As always, most trials will fail to convert from mice to humans, although a few may succeed in offering major benefits. Miracle drugs are unlikely to emerge overnight, but 15 to 30 years is a credible timeframe to test the full potential of the science.

To help realise this, I propose an international effort to coordinate research in this field. This would allow governments to share the costs of exploratory research while spreading the benefits of discoveries. Here, we can draw inspiration from international collaborations like Cern in Switzerland, which now hosts 10,000 scientists from over 100 countries—all seeking new discoveries in particle physics.

A Cern for ageing research group would aim to develop new diagnostics for testing interventions, better coordinate existing efforts and build an interdisciplinary cohort of scientists exploring ageing across the whole life course.

Just as researchers at Cern have licence to explore the secrets of space and time, we need to mobilise a generation of scientists investigating how time affects the human body. It is not enough to focus only on designing better devices and medicines for managing the symptoms of ageing; we also need to tackle the underlying processes that lead to disease. This is humanity's oldest problem, and one worthy of international attention.

James Kirkland is a professor at the Mayo Clinic and president of the American Federation for Ageing Research

Today, a one-year-old girl born in the UK has an average life expectancy of 91 years and an almost 20 per cent chance of living beyond 100



Make the UK a living lab for mapping the exposome

Tina Woods



Today we understand the factors shaping our health incomparably better than a generation ago. 2023 marks 20 years since the mapping of the human genome, in which the UK played a leading role.

But now the challenges look different. A healthy future means putting prevention at the heart of healthcare: striking a better balance between treating the sick and keeping the healthy healthy. It also demands we tackle the terrible health inequality problem exposed by the pandemic, which has led to a roughly 20-year difference in healthy life expectancy between richest and poorest.

We know that differences in health outcomes are driven more by society than biology, and in the US, at least, around 80 to 90 per cent of these social determinants have little to do with clinical care. But compared to the depth of our understanding of physiology, our understanding of how surroundings influence our health is poor. Yet now we have the tools to change this—the data revolution in every aspect of our lives means we can take

science “out of the lab” and into our cities, communities and homes. This would reveal the complex patterns and vital clues that link our environment, behaviours and health.

This world of data paves the way to another holy grail of health akin to mapping the genome: mapping the “exposome”—the system of all external factors that influence our health and wellbeing trajectory. Building on existing efforts in the US and elsewhere, charting the exposome would deliver deep insights into the underlying causes of disease itself. We do not and will not gain these insights without connecting genetic, biological, behavioural, environmental and financial data. The answers are there.

This won’t be without challenges. While the technical complexity is immense, what is more difficult will be encouraging citizens to share health-relevant data at scale, requiring serious thought and safeguards around privacy and (anonymised) data. But if open banking is possible, open health should be too. The prize is huge for both the

health and wealth of the nation: by delving deep into the complexities of the ageing process that underlies many chronic diseases, we can better reduce the strain of treatment costs on our health services budget.

As with the genome, the UK is uniquely placed to lead this endeavour. With smart regulation, the UK could become the centre of this global effort—a living lab—anchored in the unmatched data opportunities offered by the NHS as the world’s largest healthcare system, and connecting this data to other health-relevant data sets across our lives to understand the intricate mechanisms keeping us in good health. These insights can be applied to infrastructure, services and policies to create environments in which people thrive.

When scientists mapped the genome 20 years ago, they couldn’t have imagined that just two decades later we would have the data and technology to make mapping the exposome possible—or that it would even be credible as a moonshot investment. Now that we do, what better way to commemorate their achievement by embarking on a “Healthy Longevity Innovation Mission”, supported by the government and private sector to nurture healthy people, a healthy planet and healthy growth?

Tina Woods is chief executive for Collider Health



A healthy future means putting prevention at the heart of healthcare

WINNERS TAKE ALL

A level playing field is the only thing you can't find online. The rise of a new breed of tech titans has shifted the economic paradigm and governments are scrambling to adapt

Early web pioneers dreamed of a decentralised, democratic internet beyond the reach of corporate and government power. What they got was a handful of tech giants dominating markets and digital services. According to traffic analysis website Statcounter, Google has around a 93 per cent share of the search engine market worldwide; its nearest rival, Bing, has 4 per cent.

This degree of dominance presents a growing risk that market leaders have a reduced incentive to offer good deals, innovate or expand consumer choice. Downstream, technology platforms have also been associated with the rise of precarious and low-quality jobs which entrench economic inequalities.

Much of the discrepancy between tech giants and their rivals can be attributed to three things: network effects, the power of data and the platform business model. Network effects reinforce the power of larger firms and “first movers” that have already succeeded in capturing a critical mass of consumers. This is particularly important on social media sites where the value to the user is represented by the volume of potential connections. Data (in tandem with AI)

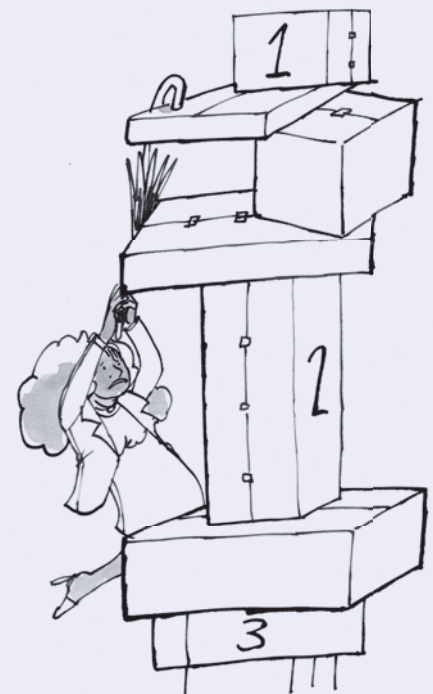
can be used to generate more sophisticated services, that in turn attract more users, who then provide more data. Platform business models can scale rapidly as they often rely on the existing internet, as opposed to depending upon new physical infrastructure or the recruitment of large numbers of staff.

The existing regulatory tools intended to rebalance market power were designed before the digital age and are proving less and less effective in this new commercial landscape. For instance, measures that focus on blocking mergers between larger companies have limited effect given how bigger firms often buy startups before they scale.

Just as the regulators of the past failed to imagine how the internet of today would re-shape markets and society, are we also guilty of a failure of imagination when it comes to the internet of the future? There are already signs of a so-called “splinter-net”, where the web starts to fragment into regional fiefdoms—a development that has potentially far-reaching implications for geopolitics and freedom of expression. Meanwhile, next-generation innovations like

Web3—a collection of decentralised technologies and protocols—are sparking a flurry of hype.

Given the frenetic pace of change in this area, our contributors all argue for a levelling of the playing field. For Geoff Mulgan, this means a radical rethink of how we go about taxing these new business models, while Cory Doctorow looks for ingenious ways to incentivise tech monopolies to unwind *themselves*. James Plunkett sees scope for refreshing our regulatory toolkit, with a view to opening up—not just breaking up—the tech giants.



Enticing monopolies to unwind themselves

Cory Doctorow



The Competition and Markets Authority (CMA) has admirably orientated itself towards ensuring that firms are neither “too big to fail” nor “too big to jail”. This includes blocking future “mergers to monopoly”, where fusing firms results in the sort of monopoly that kills competition and resists government reform. This is a crucial step, because monopolies are not only bad for consumer prices and workers’ wages, but also warp proper governance with their own gravity.

But blocking future monopoly formation is useless—worse than useless!—unless combined with action to break up existing monopolies. Simply capping the size of small firms where tech giants already hold sway would just rig the market for the Goliaths and not the Davids, putting them at the mercy of the big beasts for whom they will be easy pickings, with predictable results for prices and wages.

Yet breaking these monopolies is a tall order, requiring armies of solicitors and countless billable hours—something magic circle firms may relish, but that governments don’t. For those of us who remember the 1980s and its high-flying corporate raiders—who used leverage to *break up* companies, rather than rolling them into monopolies—another avenue is possible.

I propose we use the example of the 1980s and give today’s would-be raiders a pot-sweetener for bringing about similar breakups: specifically, a two-year capital-gains holiday for profits realised by unwinding economically significant mergers (over £10bn) undertaken since 2000. Watch them do in months what decades of courtroom grinding couldn’t hope to accomplish.

This is a neat scheme that ties the reward to the desired action. It’s a move



Breaking these monopolies requires armies of solicitors

that encourages genuine dismantling—a global firm that only unwinds its merger in the UK will generate fewer capital gains than a firm that dismantles itself root-and-branch. Investors will hardly tolerate leaving so much money on the table.

Subject to two iron-clad safeguards—a strict two-year deadline to provide urgency and ensure tax-free profits are from the breakups and not subsequent growth, plus a 10-year prohibition on re-mergers—we can be confident that this is an all-round win. Historically markets have rewarded breakups handsomely, from the regulator-forced breakup of Standard Oil in 1911, to more than half a century later, when telecoms company AT&T was broken up in 1982. And it will still hold true today.

Cory Doctorow is an author and activist

Out of all proportion: reform the way we tax big tech

Geoff Mulgan



No one likes to pay tax and few like to think about tax. Perhaps this is why there has been so little radical tax reform for over a generation, despite profound changes to how our economy works.

As a result, the tax system has become one of the main drivers of the “winner takes all” digital economy, with dominant firms still paying little if any tax. Since demands on government spending have escalated, this has meant a bigger tax burden on everyone else.

Europe has belatedly started introducing modest digital services taxes, though these are caught up in arguments with the US (since they mainly hit American firms). These target overall sales, but there are strong arguments for a more sophisticated approach.

The challenge of tax design is to tax fairly without inhibiting productive and creative activity. Here economic theory is helpful. Firstly, it tells us that industries with close to zero marginal costs and network effects will tend to become very concentrated (as has



The challenge of tax design is to tax fairly without inhibiting productive and creative activity

happened with Google for search), and secondly that it is possible to levy quite high taxes on marginal revenues without disincentivising investment (the UK’s “Eady levy” on film distribution is a case in point here).

This is the argument for what I call “Proportional Marginal Revenue” taxes which do what they say on the tin—tax marginal revenues, whether for Hollywood films and Netflix series or digital platforms like Meta. The logic of such taxes is that once a film, piece of software or operating system has covered its costs, new revenue from a new customer is essentially a windfall: marginal revenue, with almost no marginal cost, that then becomes surplus for the owners.

Proportional Marginal Revenue taxes can begin quite low, for example at 25 per cent, and should only kick in over specified levels of demand or market share, so as not to hit startups or stifle innovation. Designed well, they could raise a lot of money without distorting effects on behaviour.

Moreover, they are simpler to implement than structural separations and demergers—helping us all to benefit from network effects while also encouraging competition (since they would stem the flows of cash enabling so many dominant incumbents to buy potential competitors).

Ideally, they should be implemented at an international level. But their virtue is that they don’t have to be since they target revenues, which by their nature happen in particular places.

Today, we have an economy structured around intangibles, but a tax system largely trapped in the tangible worlds of consumption, income and property. Without a healthy tax base no society can thrive. My modest proposal would rebalance a system that is skewed in favour of the rich at the expense of the poor and hardworking. *Geoff Mulgan is professor in STEaPP (Science, Technology, Engineering and Public Policy) at University College London*

Don't break up big tech monopolies—open them up

James Plunkett



We find ourselves, again, in a new age of monopoly. The question is: what do we do about it this time?

The answer in a digital future won't be the same as in the industrial past. Back then, we tackled market power with nationalisation; utility regulation; blocking mergers and acquisitions; and the ultimate intervention, breaking up monopolies. But those tools aren't right today. Platform monopolies are too complex and too fast—and the economic fundamentals from which their power arises don't submit to those old policy tools.

So, my advice is this: don't break up big tech monopolies, open them up.

How? First, we need legal groundwork. Currently, the idea of a “platform”

doesn't exist in law. As a work-around, we govern 21st-century platforms using 19th-century company law, when really these are unprecedented institutions with powers beyond the wildest imaginations of Victorian legislators. So, step one is clear: define the platform in law and build a scaffold.

Step two, build a new legal regime on that scaffold. One big aspect of this will relate to interoperability—rules that require major platforms to allow us free passage through their ecosystems. This would include posting and transferring data between platforms, plus allowing entrepreneurs to build services that work across these ecosystems without fear of being cut off.

Another priority is the creation of rules to prevent the data we generate as

we move around the internet from being hoarded by private companies. It's a public good, and a vital source of future innovation. It should be open, in aggregate form, for innovators and researchers to use.

And, thirdly, we must codify new civic responsibilities for platforms. The time is over when the digital world can self-regulate. It must be brought up to the standards of conduct we expect in public spaces—turning the private baronies into digital commons.

This might sound radical, but really, it's routine. When a new technology emerges, the early decades are often a wild west scramble as private firms and the men (always men) who run them gain powers beyond their legitimacy or the interests of society. So, while our regulatory tools must change, the job for policy remains the same—to mature how we're using new technologies, so that they work for us all and not just for a narrow elite.

James Plunkett is executive director of advice and advocacy for Citizens Advice



We must codify new civic responsibilities for platforms

Analysis of nearly 6,000 firms with annual revenues greater than \$1bn found that the top 10 per cent captured 80 per cent of economic profit over several decades at the turn of the millennium



THE ANTHROPOCENE DIET

The trade-offs behind our diets are becoming harder to swallow. Increasingly, the food we eat is coming at a cost to the environment and our own physical wellbeing, so how will we start to square the competing demands of sustainability, price and nutrition?

According to some scientists, the Earth has entered a so-called “anthropocene age”; an epoch defined by the profound impact *Homo sapiens* is having on the earth’s climate, biodiversity and ecosystems. Unsustainable approaches to food production have driven many of these changes.

The UN estimates that livestock produce more than 14 per cent of all human-induced greenhouse gas emissions and the global food system is thought to use 70 per cent of freshwater on earth. The environmental impacts of feeding the global population could increase by up to 90 per cent between 2010 and 2050, assuming no action is taken to counteract expected changes in population and income.

Yet our diets aren’t just environmentally unsustainable, they are also contributing to public health crises like obesity. Adult obesity rates in England have roughly doubled since 1993 and most adults are now overweight or obese. This has contributed to an increase in diseases like diabetes, alongside associated costs: in 2014–15, the NHS spent more than £6bn tackling the direct consequences of obesity.

The lion’s share of this collective weight gain can be attributed to the food we eat, which in turn is shaped by the food environments in which we find ourselves. Beyond obesity, the composition of our diets shapes our health in myriad other ways—such as the link between the red meat and bowel cancer.

The challenge of feeding ourselves in the future is not limited to the nutritional composition of our diets, it is also a question of cost. Spiralling food prices in the UK point to the increasing vulnerability of our food system to global economic shocks. In the recent past, consumers in this country paid some of the lowest prices for food anywhere in Europe. According to the National Food Strategy, chicken is nearly three times cheaper today than it was in the 1960s.

Over the last year fresh food inflation has rocketed to over 10 per cent, with huge consequences for consumers, particularly those in poverty. The Trussell Trust reported an 81 per cent increase in food parcels distributed by its food bank network in 2021–22, compared to the same period five years ago.

Adapting to the demands of the Anthropocene age will force dramatic changes to the way we grow and source our food. Policymakers will grapple with difficult trade-offs when seeking to regenerate ecosystems and rebalance diets without imposing ill-timed costs on consumers. Harnessing innovative approaches from technologists, farmers and industry will likely prove essential.

Pre-empting such questions, Thomasina Miers spotlights the role the public sector could play in boosting regenerative farming, while Marco Springmann looks to a future where we price in the environmental and health costs of food more transparently. For Christina Adane, it is essential to put young people in the driving seat when it comes to tackling the poor food environments that distort their diets.



Public procurement can catalyse a regenerative farming revolution

Thomasina Miers



Our oil-hungry food system, with its predilection for producing ultra-processed, long-life foods, is killing more people a year than smoking. It is also wrecking the environment because of its heavy dependence on pesticides, herbicides and fungicides that can wipe out critical insect populations, pollute waterways and destroy the topsoils where we grow 95 per cent of our food.

But there is another way. Regenerative farming can break this destructive cycle. We can use a combination of practices that progressively improve the topsoil and wider ecosystem. This innovative approach would move us away from current agricultural techniques, with their huge dependency on oil and gas, not least for the production of ammonia-rich fertilisers and pesticides.

Today, around one-quarter of the world's greenhouse gas emissions come from food and agriculture, according to the University of Oxford's Our World in Data publication. Regenerative farming has the potential to substantially reduce these through means like sequestering carbon back into the soil.

To kickstart this shift in the UK I propose that, by 2035, half the roughly £2.4bn of publicly procured ingredients (for schools, hospitals and so on) should be grown through regenerative means. We need to recognise the importance of good food for health and education; this should be reflected in hospital and Ofsted inspections. We could also encourage skills training in kitchens, and introduce clearer labelling on food products.

In time, we will find that by combining technology and our growing

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Today, around one-quarter of the world's greenhouse gas emissions come from food and agriculture

knowledge of how soils—and the microbial networks within them—function, we can make huge innovations in this area, allowing the nation to eat better food. The success of regenerative agriculture is relatively easy to measure by testing soil for microbial activity and the presence of micronutrients.

Strategies to improve health and the environment through public food procurement look promising. A scheme in Denmark that encourages organic farming through public procurement has been shown to have the potential to improve health, reduce the cost of healthcare, help the environment and even strengthen workforce motivation.

Denmark shows what can be done. That scheme and its framework can provide us with a roadmap for the positive journey that can follow a shift to half of publicly procured food coming from regenerative farming. This is a proposal that should improve the country's health while also producing a visionary and effective response to climate change.

Thomasina Miers is a writer, chef, co-founder of Wahaca and trustee of Chefs in Schools

The young are paying a price for unhealthy food, let them choose how to invest the profits

Christina Adane



For too long individuals have been blamed for having poor health.

We have been hearing the same “eat less, move more” message for decades, yet obesity continues to rise. The best evidence shows that much of the responsibility for our bulging waistlines lies with the food environments that we live in rather than personal willpower.

Decision-making about our food environments—by both citizens and governments—is muddled by confusing or missing information. Big Food companies bombard us with junk food

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Decision-making about our food environments—by both citizens and governments—is muddled by confusing or missing information

ads while subverting the obesity issue with clever marketing techniques like “halo advertising”—promoting products as healthy that are actually high in fat, salt or sugar.

Young people suffer from toxic food environments over the course of their lives. We need systems that recognise this and deliver a twin-track approach that provides clarity and promotes intergenerational fairness.

To help unmuddle us, we need to cut through the noise. Henry Dimbleby's 2021 National Food Strategy recommended that the government introduce mandatory reporting of food sales by larger companies, open for all to access. While some retailers are reporting voluntarily, and the government has promised to consult widely on this matter, we urgently need to take the next step: creating a comprehensive, uniform reporting system.

We must act on the insights provided by this data. We should set obligatory health targets for companies that lag behind, with fines for those that don't move quickly enough. To give industry time to adapt, these targets could ratchet up gradually over time.

But the proceeds of these fines shouldn't just disappear into government coffers. They need to be used to help those who suffer most from the consequences of living in food deserts.

And here's where we join the twin tracks: who better to decide how this money might be spent than young people who have experienced poor food environments and who will have to live the longest with the burden of ill health associated with them?

We should redistribute the money raised by these fines to the different cities and regions of the UK where

SOURCE: SPRINGMANN M ET AL. (2018). OPTIONS FOR KEEPING THE FOOD SYSTEM WITHIN ENVIRONMENTAL LIMITS. NATURE 562, 519–525 (2018). [HTTPS://DOI.ORG/10.1038/S41586-018-0594-0](https://doi.org/10.1038/s41586-018-0594-0)



The environmental impacts of feeding the earth’s population could increase by up to 90 per cent between 2010 and 2050, assuming no action is taken to counteract expected changes in population and income



18- to 24-year-olds can decide how they might be invested to improve their food environments. This process would offer young people the opportunity to reimagine what healthy streets, screens and schools look like. It could also draw upon lessons from youth-led participatory budgeting exercises, such as those undertaken in North Ayrshire.

If companies are to profit from selling unhealthy food, then younger generations should be compensated. *Christina Adane is campaigner-in-residence for the NGO Bite Back 2030*

It's time to price in the true costs of the food we eat

Marco Springmann



To tackle rising food prices and help citizens choose healthy and sustainable diets, I propose that we price foods according to their health and environmental impact.

Our diets, with their large portions of meat and dairy, are major risk factors for heart disease, stroke, diabetes and

cancer, and are associated with one in five premature deaths. These diets are also major drivers of climate change, biodiversity loss and environmental pollution. What we eat now determines what environment we will leave for future generations.

Unlike cigarettes or diesel, the prices that we pay for food don't reflect their health and environmental costs. This is a glaring omission, and one that leads to consumption decisions that are neither healthy nor sustainable. Nor is it good value for money, as citizens' taxes will have to pay for the health and environmental costs of this gastro-gaslighting.

Introducing a fair and transparent pricing system for different foods that accounts for their real health, environmental and social costs would help citizens choose diets that are healthier and more affordable, while also protect-

ing the environment and its natural resources for future generations.

Under fair pricing, meat and dairy would become more expensive. This in turn would create the revenue to provide targeted information campaigns on how to prepare healthy and sustainable meals, while making plant-based foods such as fruits, vegetables, legumes and whole grains more affordable to consumers—for example through rebates, targeted VAT cuts, or public health promotion programmes.

With the right delivery, interventions to correct our price signals would have few downsides. It could be cost-neutral for the government, and instead of nannying citizens it empowers them to choose diets that are affordable for them, their health and the planet. It also allows politicians to demonstrate they are less concerned about the profits of businesses that put our health and the environment at risk, and more concerned about the rights of citizens, their health, and the health of our environment—now and for generations to come.

Marco Springmann is professor in climate change, food systems and health at the London School of Hygiene and Tropical Medicine



What we eat now determines what environment we will leave for future generations

THE NEW DEMOGRAPHICS

The demographic equation that props up society—and our tax system—is in flux as we live longer and have fewer children. With the after-effects of Brexit reverberating through our labour market, will attitudes to immigration start to shift? And how do we make the most of our longer lifespans to combine care, work and learning more creatively?

The doubling of life expectancy over the last 150 years represents one of the most remarkable achievements of humankind. Yet rising longevity, combined with falling birth rates and an anti-immigration turn in UK politics, presents a long-term economic conundrum for policymakers.

While there has been a small uptick in fertility rates in England and Wales in the last couple of years, women now generally have far fewer babies than they did a century and half ago. Projections estimate that there will be one adult of pensionable age for every three adults of working age by 2045, a 20 per cent increase from today. This could create a growing economic imbalance between costs incurred by the state (for example in the form of social care) and income generated by the labour of present and future taxpayers.

It is essential, then, to make the best use of the skills of the whole workforce. Yet there are indications that we are at risk of underutilising the wealth of expertise held by older workers. While the number of over fifties in employ-

ment has grown over the last two decades, this group was more likely to be made redundant during the pandemic than younger workers and less likely to be re-employed—a “Great Retirement” to mirror the “Great Resignation”.

Immigration has often been seen as key to smoothing out demographic imbalances in the labour market, given that many immigrants move countries in pursuit of work. Indeed, since 1994 there have been more people entering than leaving the UK. However, an increasingly hostile political climate meant that the topic of immigration became a flash point at the core of the Brexit debate.

Subsequently, public attitudes appear to have mellowed. An Ipsos survey found that between 2015 and 2022 the proportion who want to see immigration reduced fell from 67 per cent to 42 per cent. Moreover, decisions about immigration aren’t simply a cold economic calculation: geopolitical crises such as the war in Ukraine can suddenly influence the public’s willingness to welcome refugees.

If the UK experiences ongoing labour shortages in the wake of developments such as Brexit and early retirement, policymakers might rapidly find themselves looking for more proactive responses to long-term demographic trends. A protracted period of rising inflation and sluggish productivity could further increase the pressure to jump-start economic growth.

Citizens, of course, make far more than an economic contribution to society’s future, with the value of unpaid care and volunteering often going unrecognised by the state. With the right support, a longer lifespan might open up the space to combine the roles of employee and carer in creative ways. With this in mind, Sarah Harper issues a call for a new “Department of Citizen Contribution” to oversee a more fluid movement between periods of work, volunteering and caring.

Minouche Shafik identifies a pressing need to supercharge the package of support for families, to make the UK a far more hospitable climate for working parents and carers. On immigration, Sunder Katwala proposes the creation of a people-led commission to take a fresh, 360-degree view on the “hot potato” questions politicians would rather avoid.

We need a people-led commission to shape the future of immigration

Sunder Katwala



If you only took your cues from Westminster, you would be forgiven for thinking that anti-immigration sentiment is hardwired in the UK. This idea, which circulates in the political press, is difficult to square with the generous welcome given by Brits hosting Ukrainians, welcoming Hong Kongers or helping resettle Syrians. If you look beyond the headlines, you will see powerful acts of kindness to strangers being carried out everywhere across Britain.

Most people are “balancers” on immigration, seeing both pressures and gains. Since 2016, the balance has shifted in a more positive direction, with a quiet, broad consensus for a pragmatic approach to issuing visas for work and study. For instance, 46 per cent of the public now see the contribution of immigration as positive, compared to just 29 per cent saying negative—a direct reversal of the position in 2015–16. At the same time, we see a more polarised debate and less public consensus over asylum and channel crossings.

Yet the balancer majority gets drowned out by heated debate online, in the media and during political campaigning, which has served to polarise the argument between left and right, cities and towns, young and old.

I propose that we harness this moment for a comprehensive migration review: a people-led commission charged with taking a fresh, 360-degree view on immigration. A grand jury of sorts, where the public can test the full spectrum of views. How could we manage local impacts fairly if migration stays high? What would the options be for reducing the numbers, if we wanted



Most people are “balancers” on immigration, seeing both pressures and gains

to do that? Could we do more to promote integration and citizenship for people once they are here?

Though views differ, this commission would uncover more common ground than many might expect about how to make migration work fairly for those who come here and for the communities they join.

Done right, giving people more voice can make immigration policy more publicly owned. But it can’t be a one-off. The home secretary should publish an annual Migration Statement—like the chancellor’s budget—providing a yearly focal point to respond to public engagement.

Meaningful contact shifts views. We should also have a national welcoming service, with a hub in every local authority area, taking a systemic approach to harnessing the appetite of the wider public to get involved. Broadening the geography of welcoming—and engaging the voice of the public in the immigration choices that we make—is key to keeping policy in step with changing views.

Sunder Katwala is director of British Future, a UK-based thinktank

Supercharge our package of support for families and invest in our workforce

Minouche Shafik



To continue to improve living standards as the population ages, we need the British labour force to engage in productive work for longer, which means supporting people to work more efficiently throughout their lives. While much of our focus is rightly on future generations of workers, there is another way to shape our economic demography: we can unleash the workers we have right here, right now.

Governments have expanded parental leave and other family programmes in the past and should do so again, to make it easier for parents to combine working with raising children.



We need to think about the infrastructure of care in our society

Childcare is more expensive in the UK than almost any other country in Europe. The current patchwork of costly provision does not make for a supportive climate in which to raise a family, a particular cause for concern given trends in birth rates.

Crucially, the hard work of caring for the next generation can no longer be taken for granted or discounted as free labour. Just as we have an education system and a healthcare system, we need to think about the infrastructure of care in our society. This is not merely for the good of children and the economy of tomorrow; it would also be a major benefit to prime-age workers and a boon to the economy of today. More support for families means more people in work and increasing numbers of well-educated and highly productive women contributing to the economy.

The government should implement a policy that provides a menu of affordable options for families, covering more generous maternity leave, paternity leave and shared parental leave (particularly with incentives for men to take their allotment). This should include a major boost to funding for childcare provision. Part-time and flexible work arrangements should come with benefits including sick leave, pensions and parental leave. For flexible workers in insecure employment, these benefits could be provided through portable pots to which all their employers contribute.

These measures would help tackle the challenges associated with a declining birth rate and change the policy climate for future generations of working parents. This is the ideal investment: flexible enough to take account of individual talents and preferences, innovative enough to capitalise on ever-evolving social norms about work and family and with real returns in economic productivity. *Minouche Shafik is director of the London School of Economics and a former deputy governor of the Bank of England*

Establish a Department for Citizen Contribution in place of the DWP

Sarah Harper



As our population ages, now is the time to address the length and pace of our working lives and start recognising the often hidden contribution of carers and volunteers. This calls for a new mindset around how work fits with our lives—a change that should start at the top. I propose we abolish the Department for Work and Pensions, establishing in its stead a Department for Citizen Contribution: the DfCC.

Changes to the machinery of government don't often excite, but this would be a first step in acknowledging that many of us give valuable labour across our lives to our families and communities, not just our workplaces.

And this isn't just a case of changing nameplates on a building. This new ministry will be charged with seamlessly linking the different phases of activity—education, leisure and employment—in a flexible journey across the course of a lifetime.

Top of the list of priorities for this new department would be testing the creation of a Citizen Living Wage, to embed the link between civic contribution and state support; a principle the current system does little to signal.

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Individuals will be able to contribute more fully across their lives, whether through creativity, productive labour or by providing support and care for others

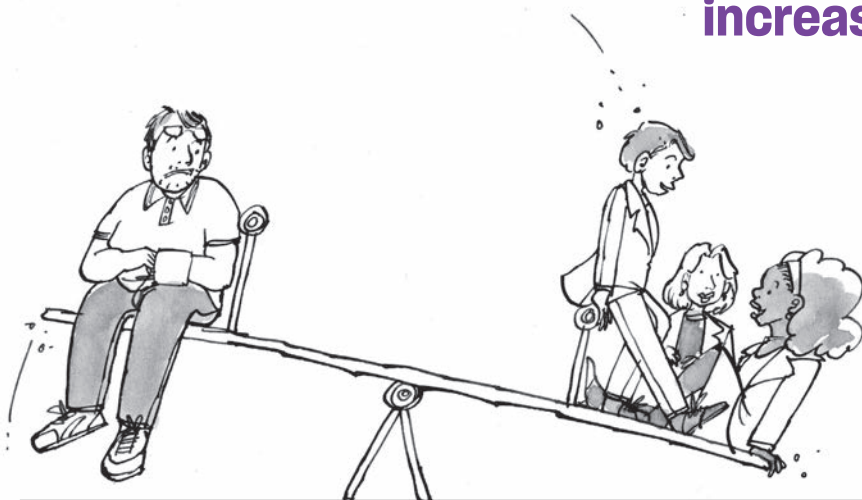
This could unify the existing patchwork of support for caring and provide volunteers, alongside carers, with National Insurance credits. The upper reaches of this ambition would see a full living wage for those engaged in these vital civic activities.

The living wage would also support retraining over the course of an individual's life. No longer confined to a rigid work-life framework, individuals could mix paid labour with caring and volunteering responsibilities as desired or necessary, and develop new career opportunities too.

Such flexibility would also harness the wealth of experience and expertise of the increasingly large number of older adults. Individuals will be able to contribute more fully across their lives, whether through creativity, productive labour or by providing support and care for others. This is a big step towards an age-integrated society, where all contributions are recognised, respected and rewarded.

Sarah Harper is Clore professor of gerontology at the University of Oxford

There will be one adult of pensionable age for every three adults of working age by 2045, a 20 per cent increase from today



DISINFORMATION SUPERHIGHWAY

The power of the web to amplify misinformation is fast becoming a profound threat to social cohesion and democracy itself. Can citizens be equipped to resist conspiracy theories?

The potential access to knowledge and vast digital networks of like-minded people seemed limitless in the 1990s. But this promise has soured as technology is increasingly harnessed to sow division and peddle conspiracy theories. Parallel tribes are incentivised to adopt extreme behaviours by the very design of the digital platforms they use—and are becoming increasingly distrustful, not only of each other but also of the very idea of objective “truth”.

According to analysis by BuzzFeed, the top 20 fake US election stories published on Facebook in 2016 generated more engagement than the equivalent stories from mainstream outlets. The issue is similarly widespread in the UK: one survey conducted by Loughborough University found that almost half (46 per cent) of respondents had come across news in the past month on social media that they thought was not fully accurate, while nearly 43 per cent of those sharing news admitted to having passed on content that they knew was fake.

Worse, the task of differentiating between authentic content and fabricated material is likely to get

harder, as the technological means of creating convincing deepfakes with AI go mainstream. But technology can also be used in the fightback; for example, journalists and fact-checkers are testing the potential for AI to be deployed as means of flagging unreliable information.

The knock-on effects of disinformation for democracy, social cohesion and public health (as evidenced by Covid vaccine scepticism) have been well documented. The integrity of democracy depends on voters being able to make informed choices and trusting the outcome of elections. Protecting a journalistic ecosystem that strives to report the truth is therefore not just a

policy priority, but a national security one too.

Our contributors explicitly acknowledge the national security risk posed by disinformation: Elisabeth Braw suggests that just as those on the domestic front in the Second World War were warned against irresponsible information-sharing, we need a modern “pre-bunking” service to protect citizens. Ethan Zuckerman looks ahead to a future where policy-makers might get one step ahead of conspiracy theorists by using AI to simulate the more paranoid corners of the internet. David Halpern sets out an ambitious agenda for proper democratic governance of social media platforms—with rights, processes and user representation properly codified.



Create a psychological defence agency to “prebunk” fake news

Elisabeth Braw



Information resilience is a priority for the future. We now know what happens when fake news infests a country: the storming of the US Capitol on 6th January 2021, and in the UK, the multiple anti-vaxxer assaults on NHS vaccination sites. If disinformation and misinformation are allowed to proliferate, our societies will become ungovernable.

Preventing hostile states and others from spreading falsehoods is virtually impossible. But there is an answer: fight back. I propose that the government create a psychological defence agency. This might sound far-fetched, but Sweden created just such an agency in early 2022. Like the Swedish pioneer, the UK agency would detect foreign disinformation campaigns being directed against the country and skilfully counteract them.

It would also fund accessible informational literacy courses, delivered, for example, by our wonderful public libraries. These could be designed by librarians and digital experts, run flexibly (for example at weekends or in the evening) and built on the best approaches already demonstrating results, like pre-bunking, which involves showing people examples of how misinformation works so they are better equipped to spot it in the future.

The goal is to teach citizens how to verify and evaluate information—recog-

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We need to treat disinformation as a serious existential threat

nising that virtually no adult is trained in it, and that it’s a skill already vital for day-to-day life and set to be more so. To underline its importance, the training could conclude with an exam—the information equivalent of a driver’s licence and perhaps just as important for helping citizens navigate their daily lives. It would be equally useful for employers and the economy at large—which organisation today can afford to hire employees who don’t know how to verify information? And which democracy can survive where people cannot agree what constitutes a fact?

We need to treat disinformation as a serious existential threat. During the Second World War, psychological defence was a vital part of Britain’s resilience: the entire population was called on to be careful with what information they shared, and judicious in what information they trusted. Today the same advice holds true.

Elisabeth Braw is a senior fellow at the American Enterprise Institute

We the users: shifting power from platforms to people

David Halpern



The online world increasingly *is* the world. It’s where we share with our friends and collaborate with colleagues. It’s the lens through which we see relatives, strangers and distant events. And it’s a marketplace of ideas and products.

But while it increasingly shapes our lives, how can we start to shape it?

The current answer is a disorganised tussle, waged between governments and tech giants—with battle lines drawn on censorship, free speech, privacy and revenue. But this is a trap, set to create lots of heat but little light.

If the question is who should decide between government or platforms, then the answer is neither. A better answer is to shift the power to users. In this, we should be guided by four principles.

First, freedom of experience. We should maximise the power of users to

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We need to allow users to shape the architecture of the digital world—to be part of its governance

shape their own experiences on social media platforms. Toggles that alter filters, feel and content should not be buried in complex menus, or locked down by algorithms.

Second, the right to move your data. Users should be able to export and own their data, meaning they can easily join other platforms. Imagine if changing your mobile phone provider meant you had to wipe your phone.

Thirdly, the right of appeal. Users need to have channels through which they can understand and challenge decisions. We are already seeing the emergence of de facto private law, such as when users wish to contest why a given image was taken down, or their profile or avatar removed. This “law” needs to be codified and linked to an ombudsman system with a degree of independence from the platforms themselves. The most difficult cases, that concern new phenomena or matters of principle, should be escalated to a judicial body.

Finally, but perhaps most importantly, the right of representation. We need to allow users to shape the architecture of the digital world and to be part of its governance. Trials have shown that users are perfectly able to understand, and make coherent recommendations on, the rules of the digital world. Why should this part of the public sphere escape appropriate democratic governance?

It is time for regulators and governments to give up trying to micro-manage the key players. We must meet the challenge of platforms with our own platform of democratic governance—with rights, processes and user representation properly codified.

David Halpern is chief executive of the Behavioural Insights Team

LOUGHBOROUGH UNIVERSITY (2019) NEWS SHARING ON UK SOCIAL MEDIA: MISINFORMATION, DISINFORMATION, AND CORRECTION - SURVEY REPORT. AVAILABLE AT: [HTTPS://WWW.LBORO.AC.UK/MEDIA/AREA/RESEARCH/03/C/HADW/ICK%20VACCART%2003C-1%20NEWS%20SHARING%20IN%20UK%20SOCIAL%20MEDIA.PDF](https://www.lboro.ac.uk/media/area/research/03/c/hadw/ick%20vaccart%2003c-1%20news%20sharing%20in%20uk%20social%20media.pdf). ACCESSED: NOVEMBER 2022

A survey of British social media users found that nearly 43 per cent of those who shared news also admitted to having passed on fake news



Stress-test future policies by modelling conspiracy theories before they take hold

Ethan Zuckerman



Disinformation is already a major force in politics and it now looks certain to be an enduring one. Research shows it's extremely difficult to identify, debunk and persuade people of its falsehood, while government efforts to tackle fake news often prove to be counterproductive and implemented too late to be effective.

But there are glimmers of hope. One of these is the practice of “pre-bunking”, which aims to prevent disinformation taking hold by warning audiences about likely false narratives—debunking them before they’re encountered organically.

This naturally raises the question: how will we predict the conspiracy narratives that will take hold in future? The answer could lie in the potential capabilities of AI.

AI models are creating new works of art based on existing creations, and convincingly generating original texts. This cutting-edge tech could be deployed to simulate the paranoid corners of Reddit and Twitter. If it works, it would put us one step ahead of the curve in our pre-bunking efforts by anticipating likely future conspiracy theories before they take shape.

Of course, we may find that even by modelling millions of conspiratorial rabbit holes, predicting which narratives will resonate will remain challenging. Pre-bunking itself appears far less effective where conspiracies chime with already held political beliefs.



Like engineers testing a car in a wind tunnel, honing it for the real-world forces it will encounter, governments should start using AI to test their policies for the gusts and torsion of dangerous disinformation

Field experiments demonstrate that conspiracies will always carry great weight for a small population of highly susceptible users.

This suggests that, in addition to predicting how false narratives will take hold, we need approaches to policy development that price in disinformation at the design stage.

I propose a radical step: that governments “conspiracy test” proposals before launching them. By exposing policy to the same conspiracy-generating AI, a “conspiracy impact assessment” might help identify which elements of a policy and/or its communication are likely to ignite false narratives. This test should not serve as some sort of veto, but as a way of identifying the details that bad actors will likely hang conspiracies on.

Like engineers testing a car in a wind tunnel, honing it for the real-world forces it will encounter, governments should start using AI to test their policies for the gusts and torsion of dangerous disinformation.

Ethan Zuckerman is associate professor of public policy, information and communication at the University of Massachusetts Amherst

ALL IN THE MIND

Social attitudes around mental health have changed, but services are creaking under the pressure of rising demand. Should we open our minds to new approaches?

Public attitudes to mental health have transformed, as increasing numbers reject the stigma historically attached to conditions such as anxiety and depression. In 2021, the British Association for Counselling and Psychotherapy conducted a survey of more than 6,000 people and found that, compared to five years ago, 83 per cent think it is more socially acceptable to discuss mental health.

One of the effects of this shift in social norms is that our health infrastructure is creaking under the pressure of increased demand. Simply allowing this degree of need to go unmet is not an economically sound strategy—the annual cost of mental health conditions in the UK is estimated to be almost £118bn, more than public sector expenditure on education in 2021–22.

Covid-19 has only exacerbated the problem. A study in the *Lancet* medical journal estimated that globally there were around 53m more cases of depression in the wake of the pandemic, a 28 per cent increase from before 2020. Workforce issues are also impacting the availability of mental health services, with calls for more psychiatrists to be trained so that long waiting times can be tackled. Given the

resource-intensive nature of many kinds of therapy, what mix of treatments is likely to represent the most cost-effective strategy, given other budgetary pressures?

It has been noted that the flurry of research and development activity in the 1950s and 1980s (which led to the development of antidepressants and antipsychotics) has not been followed by similarly significant breakthroughs in pharmaceutical treatments in recent decades. Yet, at the fringes, we are starting to see new, sometimes controversial interventions being developed as alternatives or complements to existing treatments, such as the use of hallucinogens to treat depression or virtual reality to tackle conditions like post-traumatic stress disorder. Earlier this year, a startup called Clerkenwell Health opened Europe's first commercial facility for psychedelic drug trials in London, with the goal of making the UK a global leader in the field.

If attitudes to mental health have evolved over recent decades, an even more rapid shift has taken place in our awareness of the impacts of loneliness. In 2018, then prime minister Theresa May launched a loneliness strategy and the UK created a “minister for loneliness” to spearhead change.

Feelings of loneliness are often linked to early death. The underlying drivers of loneliness are poorly understood, varying significantly between individuals. But long-term trends around the use of digital technologies, remote working and an ageing population point to the need for a sustained policy focus on how to support strong social connections. Identifying the best-evidenced and most affordable interventions will prove a complex task.

Our contributors believe it is time to open our minds to new approaches. Imran Khan argues we need to dislodge political inertia around the potential of psychedelics, while Daniel Freeman argues that virtual reality treatments should feature more prominently in the therapeutic toolkit. To counter the rising tide of loneliness, Alex Smith calls for renewed investment in our social fabric, funded by a levy on automated retail transactions.



Psychedelics: expanding the therapeutic toolkit

Imran Khan



After being frozen out for decades, psychedelics are enjoying a renaissance—with early research showing they could create a mental health revolution. For example, recent trials have shown that psilocybin—the active ingredient in “magic mushrooms”—can treat clinical depression at least as well as traditional SSRI antidepressants, with far fewer side effects.

Likewise, MDMA (also known as ecstasy or molly) has been shown to have dramatic potency in treating PTSD when combined with talking therapy—a finding so significant that it was hailed as one of *Science* magazine’s ten breakthroughs of 2021, sharing the stage with advances on Covid-19 and nuclear fusion. Such is the pace of discovery that new findings are arriving every month.

Set against the scale of the mental health challenge, it now looks like an important tool has been ignored and suppressed for no reason other than social stigma and politics. Psychedelics are remarkably safe. Although they are mind-altering and not free of risks, they’re non-addictive, and the potential for physical and social harm is far lower than for substances such as alcohol.

The potential of psychedelics is, in fact, so vast that the time has come for us to dislodge the political inertia. Not only do psychedelics offer many people’s best hope for better mental health, but they give us a way to



The potential of psychedelics is so vast that the time has come for us to dislodge the political inertia

empirically study our brains and minds—likely unlocking deeper scientific discoveries.

In recognition of these early breakthroughs, we should establish a commission to investigate these substances properly, so that the work no longer has to be done in the margins of academia. Task the commission not with discussing legality, but simply with identifying if and how psychedelic medicine could be integrated into our healthcare system. It should also be given a budget to undertake necessary research to inform its findings. The early evidence we have is the first step—a crack in the door that the full weight of science needs to open.

Imran Khan is executive director of the UC Berkeley Center for the Science of Psychedelics

The surge in self-service checkouts should come with a 'loneliness levy'

Alex Smith



Despite our ever-more connected world, we live in an age of disconnection. The technology to communicate instantly and everywhere may be at our fingertips, but our sense of human connection, empathy and community has weakened.

A large number of forces have, layer by layer, built up this separation. Economic trends like globalisation and digitisation, cultural shifts like the rise in single occupancy living and even bureaucratic efficiencies like automated phonelines have reduced human interaction, contributing to a creeping and corrosive loneliness.

Research shows that this epidemic of loneliness is more than a personal crisis. It's both a public health and political crisis, too. It's a public health crisis because loneliness is associated with an increased risk or exacerbation of dementia, stroke or heart disease, and is linked to mental health problems. It's a political crisis because



Research shows that this epidemic of loneliness is more than a personal crisis. It's both a public health and political crisis, too

it leads to distrust and can cause polarisation, division and discrimination. Loneliness is also estimated to cost the economy £32bn annually due to absence and lost productivity.

We need to take steps to tackle this disconnection as a priority. I propose a simple start: a five-pence charge on self-service transactions, an anti-social behaviour levy on each of the over six billion one-sided interactions that occur every year.

There's a good argument for this, because while evidence shows that most people prefer convenience in the moment, many do not like the way these interactions over time make them feel and how they reduce opportunities for human connection. This is a trade-off that needs balancing, every bit as much as our overuse of carrier bags was rebalanced with a similar levy from 2015.

Given the cost-of-living crisis, this charge should be paid by the supermarket rather than the consumer. Extrapolating from figures calculated by the All-Party Parliamentary Group for Social Integration, it might raise perhaps £150m a year which could fund projects that build social capital in local communities. Those projects could include replacing lost venues and congregational spaces with newly emerging community-owned football clubs, or intergenerational programmes like those led by The Cares Family, the organisation I work for. The fund could also support large-scale research or trials into reducing loneliness. We need to protect local sites and sources of belonging that encourage empathy, wellbeing and connection—a loneliness levy could set us on that path.

Alex Smith is chief executive of The Cares Family

Scale up virtual therapy to bridge the treatment gap

Daniel Freeman



Since 2008, the NHS has delivered some of the best psychological treatments in the world through the Improving Access to Psychological Therapies scheme. Yet because of a shortage of trained therapists, demand continues to outstrip supply.

There is another way. With virtual reality (VR), we can get the best interventions to many more of the people who urgently need them: on-demand therapy, accessed when and where patients want. And at lower cost than traditional therapy.

VR has never been so sophisticated, easy to use and affordable. There is substantial evidence that VR can be at least as effective as face-to-face therapy for many conditions. In recent years,

we've seen excellent results in clinical trials for people with problems including fear of heights, PTSD, chronic and acute pain and psychosis. VR can be a means of delivering rapid, lasting improvements.

The most effective way to treat mental health problems isn't just to talk about them; it involves going into the situations we find difficult and learning new ways of responding. With VR, patients can experience simulations of those challenging situations repeatedly and safely.

We can also do things with VR that aren't possible with standard therapies. For example, we can create innovative

scenarios that are both therapeutically powerful and engaging for users. And by embedding a virtual therapist in the programme, we can free treatment from its dependence on scarce real-life clinicians.

With VR, a revolution in psychological treatment becomes possible. The best VR therapy is both clinically effective and cost effective. Virtual coaches can be deployed at scale and are popular with patients. To unlock this potential, we need both to continue to fund clinical research into VR and—most importantly—create dedicated implementation sites across the NHS to determine how best to provide VR to patients.

This isn't to say that we can do away with therapists. Skilled and compassionate practitioners delivering evidence-based treatments will always be needed. But if there is to be a coordinated response to the current crisis in mental healthcare, VR therapy must surely play a part.

Daniel Freeman is professor of clinical psychology at the University of Oxford

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With virtual reality (VR), we can get the best interventions to many more of the people who urgently need them

The annual cost of mental health conditions in the UK is estimated to be almost £118bn, more than public sector expenditure on education in 2021–22



THE KNOWLEDGE

Workers of the future will need to navigate the increasingly choppy waters of a labour market disrupted by automation, Brexit and the transition to a net-zero future. Can we start to better anticipate the UK's skills needs over the long term? And how radically are we willing to reimagine our blueprints for workers' rights and lifelong learning?

Global trends such as automation and climate change will re-shape whole sectors—and the UK's shift towards a knowledge economy is likely to continue. How can we reap the benefits of these changes while ensuring workers are able to acclimatise to an uncertain economic future?

The transformations wrought by digital technologies mirror those of the industrial revolution. These eventually resulted in improvements in the material standard of living for many people but only after years of dislocation and disruption, with hard fought battles for workers' rights.

Climate change, too, will require wholesale reconfiguration of many industries, such as transport and heating, which will reshape associated jobs. Brexit is already causing labour shortages in some sectors, meaning the UK will either need to direct sustained investment into nurturing domestic talent or start attracting workers to immigrate from elsewhere.

The scale of this change has sparked calls for a fundamental rethink of our systems of education, training and career development. It has become something of a cliché to observe that schooling has yet to fully evolve from the model used to train factory workers and clerks for the industrial age. Meanwhile, the provision for learning in later life—which will be critical in helping people transition between roles—has rarely featured as a top-tier political priority in the same way as education for young people.

Workplaces increasingly governed by AI will open up new fronts in the struggle for employee rights. Decisions relating to hiring, line-management and dismissal are now being made by AI in ways which could not have been anticipated by those drafting labour laws. Already, a survey of workers for the Trades Union Congress has found that 22 per cent experienced the use of these technologies for absence management, 15 per cent for performance ratings and 14 per cent for work allocation.

According to Frances O'Grady, nothing short of a new Charter of Rights will be sufficient to protect employees who find themselves working for an algorithm. The question of supporting career reinventions and retraining is addressed in Sonia Sodha's radical proposal for a drawdown fund that workers can tap into at any point over their lifetime. Modelled on the Office for Budget Responsibility, Margaret Heffernan pitches a new independent future skills body charged with ensuring the UK is sufficiently agile in the face of a deeply unpredictable labour market.



If AI is the boss, workers are going to need a new charter of rights

Frances O'Grady



Artificial intelligence (AI) is transforming the way we work. Important decisions about people's working lives, such as whether they get a job and how they are managed, are increasingly made by technology rather than a human manager.

These new technologies present us all with opportunities for a better world of work, with more reward and greater productivity. But there are also risks of unfairness, discrimination, work intensification, stress and injury, with work becoming an increasingly isolating and lonely experience.

We should have compassionate innovation where technology works for humans, rather than the other way round. I am proposing that we establish the rules of engagement now by creating a new charter of digital rights, as we here at the Trades Union Congress have set out in our AI manifesto, "Dignity at Work and the AI Revolution". These new rights are necessary because our careers are now increasingly tangled up with technology. Establishing this charter will take a cross-sector effort to agree the rules of the road ahead. Three big issues should be at its heart.

First, to protect human expertise and relationships, there should be a comprehensive right to human review of important decisions made by technology. This should include an

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We should have compassionate innovation where technology works for humans, rather than the other way round

express statutory right to in-person engagement—people should have a right to meet a person, in person, when significant decisions are being made about their working lives.

Second, it's vital that technology doesn't entrench existing inequalities. Making everyone in the AI value chain—including tech companies—liable for discriminatory algorithms will provide an important protection against this, as will mandatory equality impact assessments and making it clear in legislation that discriminatory data processing is always unlawful.

Finally, collectivism matters more than ever in the face of technological control. Collective bargaining and consultation with trade unions provide the best system of co-governance of new technologies at work. This includes workers being helped to harness their own data—collectivising this information so that it can be used to identify any unfairness at work as well as further workers' interests.

Frances O'Grady is the general secretary of the Trades Union Congress

A reinvention fund for (truly) lifelong learning

Sonia Sodha



There is a massive social injustice at the heart of our post-18 education system. It is estimated that the state spends around £29,000 on average subsidising the education of the 50 per cent or so of young people who go to university (a figure that is largely attributable to losses on loan repayments and that also varies widely between courses). Far less is spent on those who do not go to university, which acts to shore up deep-seated social inequalities. There is comparatively little provision for those young people leaving school without functional literacy and numeracy skills, or for people who need to retrain because of the changing skills requirements of the economy as a result of trends like automation.

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It is wrong that we concentrate the vast majority of post-18 education and skills funding on half of young people, for a relatively brief window in their lives

We need to completely rethink how we fund education and training provision for adults after compulsory education. The starting point should be to extend the approximately £29,000 we spend on the disproportionately middle-class group of young people who go to university to everyone, but the aim should be to spend more on all. One proposal would be to create a lifetime drawdown fund that follows individuals throughout their career that they can use to learn, train and retrain at key points.

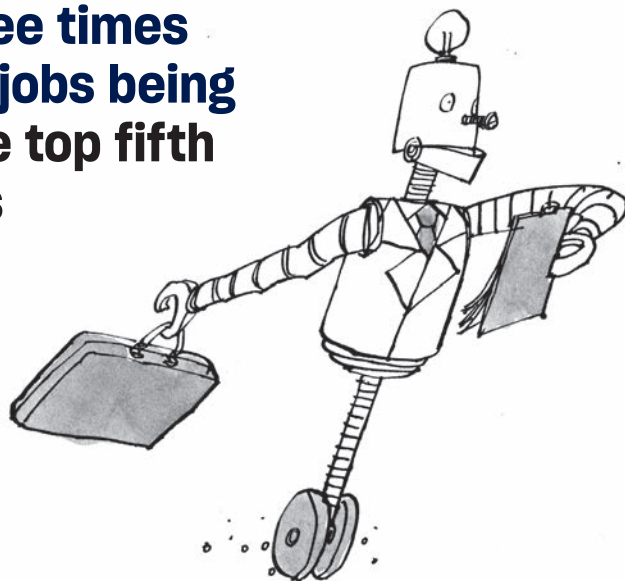
Some people might put it towards the costs of university and then also dip into it later in life for reskilling. Others might choose to spend it on degree-level apprenticeships, which allow them to work and earn while they learn. Other programmes could aim to develop skills like teamwork that are important in a service-based economy. The money could be used to bridge the gap between full-time education and work, such as supporting a year of volunteering abroad or in different parts of the country. It could be supplemented by a bespoke lifetime careers service that people could draw on to help them make decisions about how to use their fund for developing skills and retraining in a way that suits them.

It is wrong that we concentrate the vast majority of post-18 education and skills funding on half of young people, for a relatively brief window in their lives. It would be more equitable and effective to extend these resources to everyone, and make them available to draw on throughout their working lives. *Sonia Sodha is chief leader writer and columnist for the Observer*

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The bottom fifth of earners in the UK have three times greater risk of their jobs being automated than the top fifth of earners



It's time to counter political short-termism with an "OBR" for future skills

Margaret Heffernan



Facing a future that is unpredictable, we can't know precisely what competencies future generations will need. But we do know that they will experience an era characterised by climate crisis, economic volatility and the encroachment of automation into many sectors. These challenges should refocus attention towards the specifically human capabilities that young people will need to thrive: creativity, collaboration, resilience and problem-solving.

Our curriculum and assessment systems are not being optimised to foster these competencies; in some cases they actively hinder young people. The UK has been left locked into an overly politicised debate pitting "knowledge" against "skills"; a zero-sum game that serves neither young people nor employers.

I propose creating an independent Future Skills Committee (FSC), which would report the latest evidence-informed projections to parliament—much as the Office for Budget Responsibility does for the economy.

The FSC would serve as a central, independent and non-aligned authority on long-term educational policy, creating deeply informed scenarios on which to base educational provision of all kinds. It would be guided by the excellent data available on high-achieving educational systems worldwide, but would also draw on the lived experience of practising teachers, students and employers. Its mandate would be to replace ideology with pragmatism, considering education in the broad sense, for all ages. It would focus on the UK's chronic productivity problem, following and mapping trends in

careers, employment and family lives, while also considering the deep societal need to foster good citizenship, which is the basis of social cohesion.

This is not to pretend that anticipating (or even tracking) our skills needs is simple; we can't manage out uncertainty. But the FSC could lead the way in developing novel modes of measurement and a shared language. It would draw from leading frameworks on foundational competencies (such as the OECD's Future of Education and Skills 2030 initiative) and from the knowledge infrastructure in other countries (like Canada's Labour Market Information Council) as well as its own emerging data sets. Sophisticated quantitative models would enable us to develop scenarios exploring how sectors are impacted by automation and other global trends.

In the UK, spending on education in real terms has declined since 2010. The FSC would work to ensure that curriculums are relevant to a changing world and that funding matches the size of the challenge before us. Our future productivity as a nation rests on getting this right.

Margaret Heffernan is an author, business leader and management professor



We know that future generations will experience an era characterised by climate crisis, economic volatility and the encroachment of automation into many sectors

REGENERATION GAME

As fossil fuel technologies are phased out, we are set to witness a once-in-a-lifetime transformation as our homes and cities transition to green energy sources.

As the planet edges ever closer to climate change tipping points, is now the time to entertain more radical approaches to climate repair?

In the coming decades, our cities and countryside will undergo a host of transformations in response to the pressures of a changing climate. For many this shift will be most visible in cities, as just over 80 per cent of the UK's population live in urban areas.

A growing population will put pressure on the UK's built environment, but we cannot let investment in new infrastructure lead to increased greenhouse emissions. Meanwhile, the drive towards widespread electrification of heating and transport would constitute one of the biggest changes to the fabric of our streets and homes in a century. The transition will affect almost everyone. To meet our net-zero targets, the UK needs to carry out green upgrades in at least 25m homes in the next three decades—around one every 30 seconds.

Beyond our cities, rural areas will likely see a surge in nature-based efforts to mitigate the effects of climate change and environmental degradation. From less radical initia-

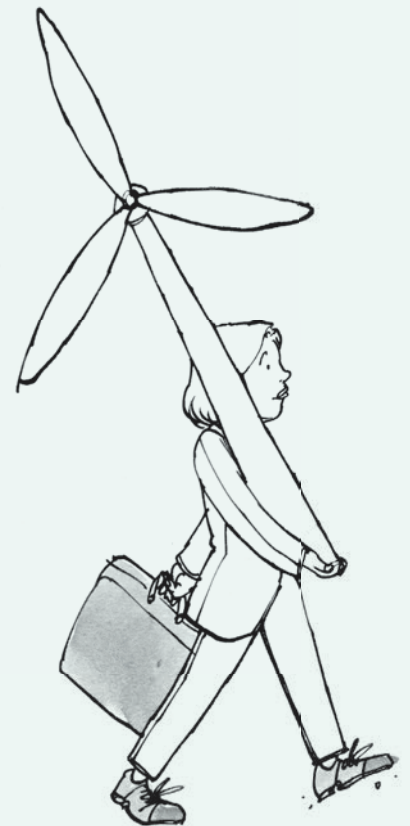
tives (such as preserving peat bogs for the vital role they play as a carbon trap) through to proposals for rewilding, we can expect to see more active management of the UK's depleted biodiversity and ecosystems in the near future.

Given that the success of climate change mitigation and adaptation strategies is uncertain, more interventionist measures—which have previously occupied the fringes—are attracting more attention as serious options. These range from less contentious approaches, such as carbon capture—which is already being piloted on a large scale by the International Energy Agency—to more controversial ideas, like adding sulphur dioxide to the upper atmosphere to block solar radiation. If the UK doesn't explore these options, other countries still might.

Our contributors urge the UK policymaking community to position itself at the forefront of innovation in this sphere. To bolster local energy capacity, Guy Newey makes the case

for enabling energy transfers between neighbours. Dervilla Mitchell argues for an injection of pace and ambition in decarbonising the very fabric of the built environment: concrete itself.

David King champions climate repair by asking: is it time to start entertaining the idea of “refreezing” the Arctic?



Why refreezing the Arctic is far more sensible than it sounds

David King



I'm now used to the stares I get when I suggest refreezing the Arctic—the polite puzzlement, and occasionally less polite reaction of TV news anchors. But this incredulity reveals more about our own attitudes to climate change. Despite the rhetoric, we haven't yet grasped how high, wide and deep the threat is. If it came in the shape of a Hollywood-style asteroid, all options would be on the table.

It's clear that our collective action isn't enough to limit the rise to 1.5°C, let alone to start undoing our historical emissions to bring this down to safer levels. We are in the business of buying time and are in the market for approaches that can hold the minute hand of the doomsday clock back from midnight long enough for the world to complete the net-zero transition.

Sensible, proportionate climate repair must be part of our plan. This includes removing excess CO2 from the atmosphere—as logical as taking pollution from a stream. And, packaged with this, refreezing the Arctic. Not as some aesthetic restoration, but an urgent fix—sealing a crack in a dam that threatens to sabotage our wider efforts if not prioritised.

It now looks certain that we have passed a thermodynamic tipping point in the Arctic. The loss of summer Arctic sea ice—domino one—is accelerating the melting of ice on Greenland—domino two—which is the problem for sea levels, meaning dominos three through to 100 will almost all involve the devastation of our global cities.

This might sound hyperbolic. But if Greenland is allowed to melt, sea levels will rise by seven metres. This truly is the stuff of Hollywood disaster movies.



It now looks certain that we have passed a thermodynamic tipping point in the arctic

The good news is we're not talking about shipping in hotel ice machines. What climate repair scientists are proposing is a programme of Arctic temperature stabilisation, most probably achieved by the method of spraying salty sea water into the clouds over the Arctic. This will brighten them, reflecting sufficient sunlight in the summer to maintain the sea ice formed in the winter, and cut off this chain reaction at its source.

The equally good news is that this global win doesn't need a global team, and as such can avoid being delayed by protracted global processes, like COP. Instead, it can be conceivably achieved by a handful of nations working and funding in concert. Global agreement is needed, however, to carry it through.

Climate repair has risks if not done right, or if conceived as an "instead of" rather than an "as well as" when it comes to the wider goal of cutting back emissions. But sensible, well-planned climate repair is a serious part of our toolkit. The UK should help lead this effort—demonstrating its commitment to preventing dangerous climate change and using its relative wealth to buy everyone some time. This time is needed to achieve deep and rapid emissions reduction globally and to remove excess greenhouse gases already in the atmosphere.

David King is founder and chair of the Centre for Climate Repair, Cambridge and a former government chief scientific adviser

Decarbonised concrete is possible, but only with an equally solid timetable

Dervilla Mitchell



After water, concrete is the most widely used material on the planet. Favoured by engineers since Roman times, today roughly 30bn tonnes of concrete are poured worldwide each year—around three times as much per capita compared to 1980.

We need concrete. It remains vital for building infrastructure that can raise global living standards, but is



A clear timetable for reducing emissions will galvanise new collaborative efforts

alone responsible for at least 8 per cent of global carbon emissions, roughly the same as the total emissions from Africa and South America combined.

The scale of the challenge means that a fast-paced, targeted innovation drive is needed to reduce demand for new concrete by reusing buildings and utilising more recycled materials. In situations where using new concrete is unavoidable, we need to reduce emissions across the supply chain from mining, transport and processing, as well as through efficient design and construction.

The innovation is out there. We are seeing more of it—for example the impressive Boston Barrier flood protection scheme here in the UK. And it has the potential to help concrete become carbon neutral or even carbon negative, by capturing industrial emissions as a feedstock for concrete production.

But this innovation needs a deadline.

A clear timetable for reducing emissions will galvanise new collaborative efforts, especially if blended with incentives that encourage the construction industry to change practices and adopt new technologies across a wide range of projects, from affordable housing to major infrastructure.

By 2030, these should include incentives for recycling concrete materials and reusing buildings over demolition. This could be done by removing VAT from refurbishment, for example, so there is a level playing field between refurbs and new builds which at present are exempt from VAT. We could also establish intelligent infrastructure procurement, to drive either this reuse and recycling or otherwise the use of low-carbon concrete. Finally, we need to see a blend of government investment and commercial incentives to create carbon capture pilots at cement works.

These are the first steps. But the deadline gives us the destination. Similar time-bound approaches have been used successfully to phase out

energy-intensive lightbulbs, and to set an endpoint on combustion engines. Yet so far, by comparison, concrete remains a missed opportunity. This is despite a recent report by the Institution of Civil Engineers projecting that the UK's concrete-related carbon emissions have the potential to be halved by 2035.

By providing key deadlines along the pathway to decarbonised concrete, we can drive engineering-led innovation in the UK, with knock-on benefits for the built environment worldwide. At the same time, we could give the construction industry the right balance of time and impetus to drive the changes we need to see.

Dervilla Mitchell is deputy chair of Arup Group and chair of the National Engineering Policy Centre Net Zero Working Group, hosted by the Royal Academy of Engineering

It's time to power up neighbourhood energy transfers

Guy Newey



As Alex Ferguson would say, it's "squeaky bum time" in the energy industry. The headlines are dire, with warnings of blackouts across the national grid where, uncomfortably, we're not entirely sure how much spare capacity we have. But

if Fergie were a power system engineer, he'd be equally sweating the *local* grid, where the picture is less clear.

Traditionally, we've not had to worry on this front—consumers turned on their lights, ate dinner and watched TV at the same time, making it pretty easy to work out when electricity was needed. But the rise of electric vehicles (EVs) and impending arrival of electric heating changes all that. It puts more pressure on the local cables where, if too many neighbours plug in their shiny new Teslas, things can go south even if the national picture is rosy.

The traditional answer is to dig up the road and put in a bigger wire, which is expensive and disruptive. But technology, and the increasing amounts of energy storage capacity in a typical home, are giving us new ways to answer the question.

A fully charged EV on the drive contains around eight days' worth of electricity for the average household. That will change as we electrify heating, but it gives you an idea of the scale of the storage coming to a parking space near you. This means that, in the near-ish future, the UK's energy isn't necessarily going to be where you think

it is. A relatively small town could potentially have more kerbside power than a major nuclear plant can kick out in an hour.

Add to this solar panels, as well as local and affordable home batteries, and it's clear that local power will be a major part of an efficient and resilient system.

The exciting potential is there; but the boring stuff isn't.

The first change required is to the rules. We need interoperable standards, agreed with generators, network operators and technology manufacturers (including the car industry). This includes communications standards so that batteries and other equipment can chat like servers on a mini-energy internet.

We can then move on the second change: incentivising consumers to play the game.

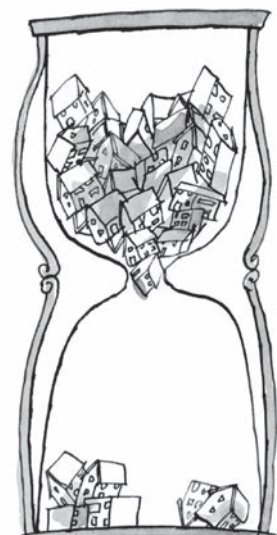
There is money to be saved here, sizeable sums from reducing grid upgrade costs that could be repurposed to incentivise early adopters instead. But the real win is going to be from working with the private sector to develop the consumer-facing deals that make people want to take part in this energy transfer market—plugging their home or car into the community grid. That might entail cheaper bills, getting paid to generate energy or peer-to-peer trading. Government and industry need to test these solutions together, until we find one that scores.

Guy Newey is chief executive of Energy Systems Catapult



It's clear that local power will be a major part of an efficient and resilient system

To meet our net-zero emissions targets, the UK needs to carry out green upgrades in at least 25m homes in the next three decades—around one every 30 seconds



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