

THE
Indigo
ERA

How creativity is reshaping our world

Dominic Barton

Adapting to Turbulence

Michael Bloomberg

Invisible Hand or Clenched Fist?

David Lipton & Ian Bremmer

The Collapse of Cooperation

Yuri Milner

The Roots of Knowledge

Stan Greenberg

We Need a New Progressive Era of Renewal

Sir Ken Robinson

Cured by Creativity

Deirdre McCloskey

Freedom and the Great Enrichment

Carl Bildt

Our Connected World: Risks and Rewards



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Global Perspectives Series Director
Stuart Bruseth

For any LetterOne enquiries contact: sbruseth@letterone.com

EDITORIAL AND DESIGN: THE BREWERY AT FREUDS

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Editor in Chief
Edward Amory

Design
Donya Davis

Managing Editor
Poppy Mitchell-Rose

Infographics
Alexandra Zielaskiewicz

Executive Producer
Michael Bodansky

Assistant Producer
Emily Lassman

For any Brewery Journal enquiries contact: alice.barrell@freuds.com

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EDITORIAL

Old global certainties and structures are collapsing, as the recent US election and Brexit vote have vividly demonstrated. A new international order is emerging. As Mikhail Fridman puts it in his opening contribution to the journal, “We are entering a disruptive era driven by extraordinary levels of human creativity,” an Indigo Era of rapid economic change that is generating winners and losers. He writes that “volatility in politics and markets is a sign of a major tectonic shift”. As he says, something strange is happening to our world.

This journal examines this economic shift through the eyes of leading commentators and business people around the world. It draws on their own perspectives and in their own words explores the nature of the change and its implications for countries, businesses and individuals. Based on these views, from a wide range of disciplines economists, historians, politicians, entrepreneurs and educationalists – a narrative emerges of our world standing at a fateful crossroads of two difficult economically disruptive roads: one path leads to a prosperous, creativity driven, connected globe with rising living standards (a “New Renaissance,” as Ian Goldin puts it), and the other path leads to a world in which the forces of reaction and fear precipitate a spiral towards a new Dark Age.

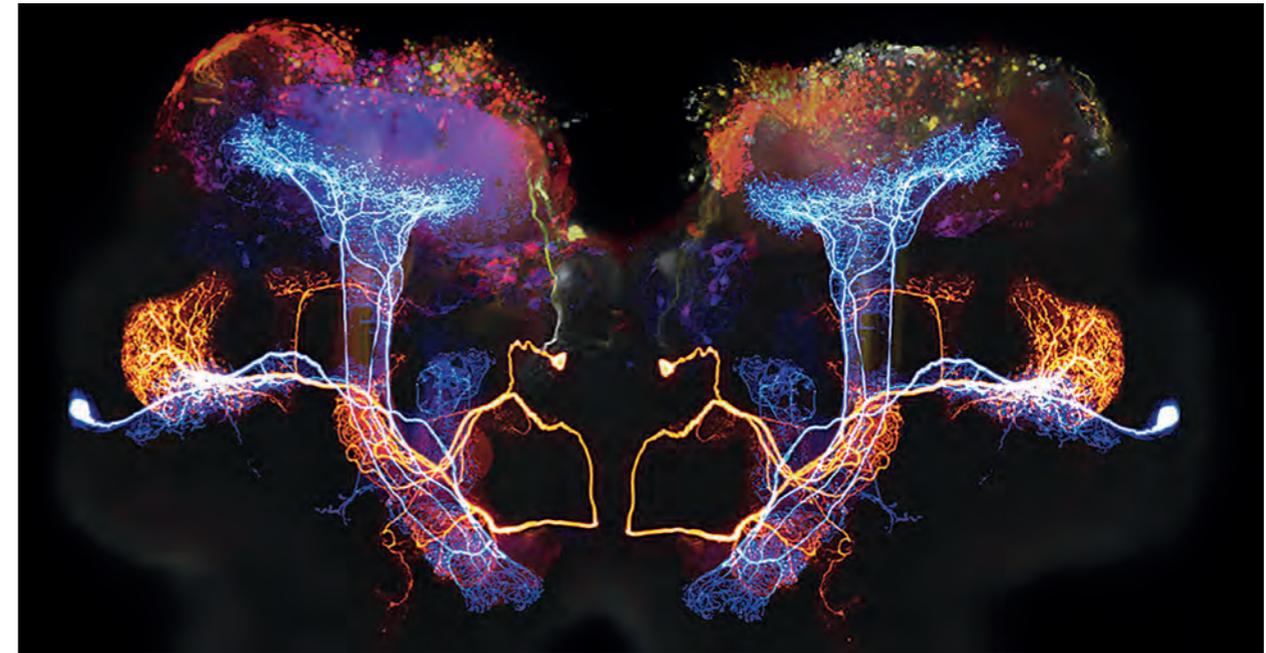
As Stan Greenberg says, “The elites are comfortable with globalisation and migration, and aren’t thinking about what this means for the average person.” We’ve seen how Trump’s vote was boosted by those hungry for radical change.

As Dominic Barton says, “The next fifteen to twenty years are going to be some of the most exciting and disruptive in human history, and one of the biggest drivers of that is the technological shifts that are under way.”

The key change taking place, according to Deirdre McCloskey, is that we are entering a digital era in which human capital is the most significant resource any country or company can enjoy. Asked what advice she would give to someone at school today, Professor McCloskey is clear. “Learn how to think. Stop reading *The New York Times*, get off the internet, and start reading serious books.”

Others agree about human capital, but fear that education systems are not teaching the skills required. Michael Bloomberg would emphasise vocational training, Ken Robinson, creativity, Tanyella Evans is working to democratise knowledge, Vince Cable quotes a slogan on the wall of a school in Germany, ‘Wissen ist begrenzt, kreativitat ist unbegrenzt’ (knowledge is finite, creativity is infinite), and Yuri Milner would emphasise, “curiosity driven breakthroughs in fundamental science.”

Other contributors emphasise the role played by digital technology and the internet: Parag Khanna argues that if the “world population has a common goal, it is the quest for modernisation and connectivity.” Which is why Alex Klein believes that “giving the next generation access to computer science education is fast becoming a basic human right and not just a luxury.” There is optimism from Carl Bildt, who points out that Afghanistan and Somalia are now two of the most connected nations on the



planet, but others like Lynda Gratton warn of the “hollowing out of work,” as technology disrupts industries and destroys middle and lower skilled jobs.

This new era is creating heroes of a new generation of entrepreneurs. Brent Hoberman believes that this will benefit the societies in which they thrive. Research conducted for this journal looks at nations around the world, and identifies those that, based on over 30 measures from a wide range of public data sources, are best placed to benefit from the new ‘Indigo’ economic order.

Many of those writing in this journal are concerned with how to deal with those left behind because, as Ian Goldin points out, the original Renaissance was nearly derailed by populists like Savonarola. David Lipton is concerned that just at the moment that the world needs greater interconnectedness and cooperation, creative destruction is building a new alliance which threatens to undermine our future. George Freeman agrees that the challenge in post-Brexit Britain is to create an economy that works for

everyone, or as Michael Bloomberg puts it, to support those who feel powerless, who see “the market’s invisible hand” as a clenched fist.

But there are different views about how to achieve this. Deirdre McCloskey wants governments to step back, Carl Bildt feels they must lean in, Dominic Barton warns that global institutions are nowhere near ready for the challenge ahead. Several contributors agree that dealing with redundant workers is critical; Dominic Barton would support a 5 per cent Labour Dislocation Challenge (money put into a fund to retrain people whose jobs are going to disappear), Ian Goldin agrees that we need more social welfare support, and Lynda Gratton argues that if we are now living to 100 we will have to return to education to reskill at different times in our lives.

One significant aspect of the challenge is migration from countries impacted by economic change. Parag Khanna argues that “there is no higher morality than allowing people to move to wherever they want to,” but while Ian Goldin believes “absolutely

fervently” in the economic benefit of migration to ageing populations, he and many others know that they must go out and win these arguments.

The future, writes Parag Khanna, “always comes faster than we expect.” It is clear from this journal that the human race could be on the brink of an extraordinary leap forward, but as Yuri Milner says, “it’s far from unstoppable.” We need, as Lynda Gratton writes, to find “great leaders who can persuade us to adapt to this brave new world,” to help our generation to discover, in the words of Carl Bildt, how to “channel these changes for the good of all.”

THE INDIGO ERA



MIKHAIL FRIDMAN
FOUNDER AND CHAIRMAN OF LETTERONE

Exploring the rise of the Indigo Era, how it will impact the global economy over the coming century, and why we need education, creativity, entrepreneurial infrastructure and digital skills to allow humankind to realise its economic and creative potential in this new age.

AS GLOBAL INSTABILITY SPREADS, THE 'INDIGO' ECONOMY RISES

Something strange is happening to our world. The basic principles, rules and values that have long served as the foundation for our lives are falling apart. Fragility and instability are spreading like a virus, infecting countries and continents.

European leaders are struggling to hold their 'project' together, as they contend with an economic slowdown, battle uncontrolled immigration from war-torn nations and manage Britain's exit from the EU. Parties who only yesterday were on the margins of European politics are bursting onto centre stage. Some are left-leaning, like Syriza in Greece and Podemos in Spain. Some are right-leaning, such as the National Front in France, Fidesz in Hungary or AfD in Germany. But all are populist and anti-establishment. And it is not just Europe that is being shaken up.

This is an era where abnormally talented individuals and entities are now able to realise new levels of human potential and economic achievement.

The United States of America, which was built on the principles of free markets and openness, had two presidential candidates who were either propagating socialist views or arguing for isolationism. This populist advance reflects an obvious and sad fact: old and tested truths no longer satisfy modern societies and need to be reviewed and redefined.

The economic outlook is also unstable. Extreme volatility in the markets has become the norm. This instability is usually attributed to two main factors: the sharp decline in the price of natural resources and the slowing of China's economic growth. These two factors are actually contradictory. Cheaper resources should, in theory, benefit China, the largest importer of natural resources. Western economies, which are the main consumers of Chinese exports, should also be helped by cheap energy, but there is no sign of that either.

Volatility in politics and markets is a sign of a major tectonic shift.

We are entering a disruptive era driven by extraordinary levels of human creativity. A new generation of curious, strong-willed and talented individuals is unrestricted by convention or the past. This new 'Indigo' generation is now shaping tomorrow's economy and creating national wealth. I use the term Indigo because it has been used to refer to children with special or unusual abilities [see page 77]. This is an era where abnormally talented individuals and entities are now able to realise new levels of human potential and economic achievement.

HOW IS THE INDIGO ERA DIFFERENT?

Over thousands of years, human history has been defined by the struggle for access to natural resources, or to put it simply, for land that contains those resources. Whether it is fertile soil, access to trade routes, gold, minerals, or oil and gas, land has always been a primary source of national wealth. The sanctity of national borders, which is the cornerstone of national identity, is a reflection of that idea. Fear of shortages has created cyclical bubbles in commodity markets and has inspired Hollywood thrillers about the war for oil and gas. It seemed that sooner or later the economy would run out of

something essential for its growth. Yet every time these bottlenecks – be they in rubber, Indian spices or conventional oil and gas – were resolved by finding an alternative.

This new Indigo Era undermines the hypothesis that the depletion of natural resources is imminent. The innovative potential of developed countries has allowed people to find alternatives to any such shortage. This does not mean that the world no longer requires natural resources. But it eliminates the real or imagined shortage of those resources and deprives commodity exporters of what have been super profits. Oil and gas was the last bastion of these bottlenecks and it too has crumbled, thanks to Indigo economies.

The main source of national wealth is not the resource rent but the social infrastructure that allows every person to realise his or her intellectual and creative potential. It is for this reason that Exxon, once the world's largest company, has been overtaken by Apple and Google. This represents a paradigm shift in which creative, non-linear thinking and random ideas are turned into new scalable services in a short space of time.

REQUIREMENTS FOR DEVELOPING AN INDIGO ECONOMY

World-leading firms such as Apple and Google have introduced revolutionary

changes in business through innovation. So let's call them Indigo companies.

The main source of national wealth is not the resource rent but the social infrastructure that allows every person to realise his or her intellectual and creative potential.

One can see three main interconnected factors that have led to their achievements.

The first requirement is intuitive individual talent and a high level of education. The originator of an idea has to be not only creative but also well-educated and able to form a team of equally educated and gifted people.

Second, to realise an idea, even the brightest innovator needs the cushion of a 'cloud,' a sophisticated infrastructure for doing business. This includes a legal system that can protect both physical and intellectual property rights and a competitive environment that allows small companies to turn into giants without fear of being swallowed by larger companies at their initial stages.

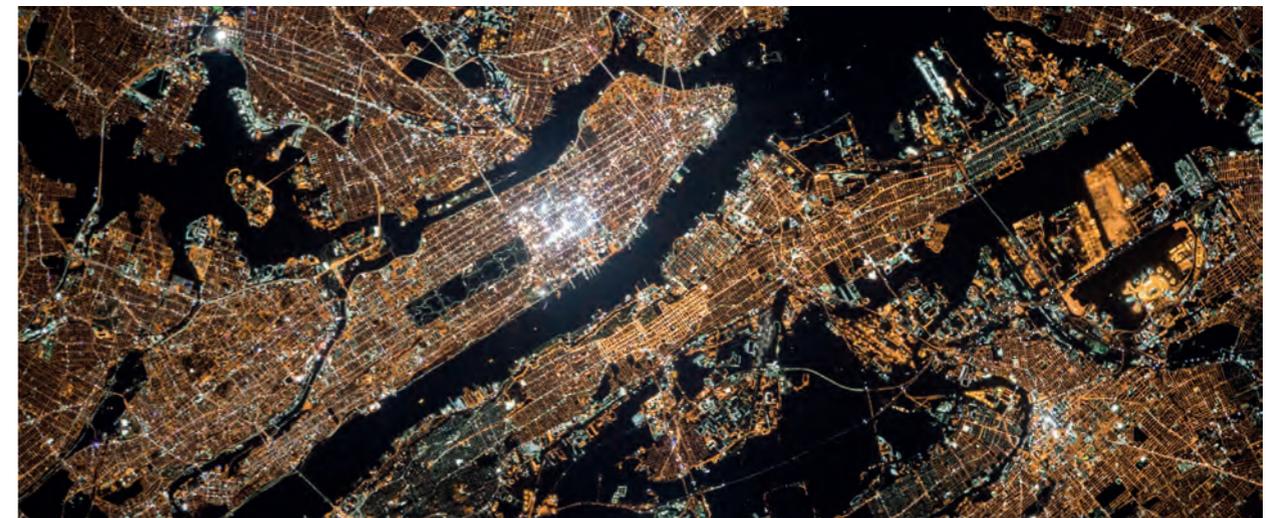
The ecosystem of an Indigo economy requires thousands of suppliers and subcontractors that can provide competitive, high-quality services ranging from venture financing to marketing and web design. This cloud of available services allows users to benefit from all these technologies without the need for deep knowledge or expertise from any of them.

Third, a global digital infrastructure is needed to distribute new products and also to accumulate customer data and new levels of insight. This enables the Indigo generation to understand customer behaviour and to create new services even before there is a demonstrated demand.

HOW EASY WILL IT BE TO REPLICATE THIS INDIGO ECOSYSTEM?

The global digital world already exists; the internet and cellular networks are reaching the most remote corners of the world.

We know from biology that human intelligence, talent and creativity exist everywhere and are equally distributed among all nations and races. Good education is not available everywhere, but all large developing countries have serious universities. Moreover, people from these countries have a chance to study abroad or take online courses provided by the world's best universities.



The most problematic area for the functioning of the Indigo economy is the creation of the 'cloud' as well as the social and institutional environment that is congenial to innovative companies. The 'cloud' cannot be built overnight. It has evolved as a result of a profound social and political development that Western societies have experienced over centuries. A firm legal system, competition rules and a system of checks and balances do not automatically result in the creation of a Silicon Valley. Nonetheless, the West has the best conditions for making breakthroughs in different spheres of human activity, be it biotechnology, robotics, logistics, or transportation. (Full disclosure: I have invested \$200 million in Uber.)

It is also clear that countries lacking Indigo-friendly infrastructures are disadvantaged. The creation of a balanced social system and a competitive, rule-based environment requires some shifts in values and thinking as well as the breaking of stereotypes.

HOW INDIGO WILL INFLUENCE THE WORLD ECONOMY

The past few decades have been characterised by globalisation and economic cooperation between the developed world and emerging countries. Emerging nations exported commodities and cheap labour to the developed world and used the proceeds to build roads, airports, cities and logistic centers. This produced new jobs and attracted foreign investment, which, in turn, boosted the growth of a modern middle class.

Governments typically favoured fast physical infrastructure projects at the expense of building institutions, independent legal systems and encouraging competition. These seemed like long and difficult tasks that did not match traditional values and often contradicted the interests of the ruling elite. The most obvious example of this approach was China.

China, where the development of institutions was sacrificed for the

sake of building new cities, has already run into difficulties trying to build an Indigo economy. Having realised the scale of problems related to the weakness of its institutions, the government has responded in its usual way: employing tactics of further centralisation and repression.

With the possible exception of India, a repeat of China's economic miracle or another emerging market boom is unlikely. Economic growth in emerging markets will slow down as a result of

Economic growth in emerging markets will slow down as a result of shrinking natural resource revenues and a decline in people's incomes.

shrinking natural resource revenues and a decline in people's incomes. The chances of these countries pulling themselves out of corruption and protectionism are remote.

This means that the rate of economic growth in emerging markets will increasingly lag behind that of the developed world, further widening the gap in incomes and standards of living. The mutual resentment driven by the inability of emerging markets to catch up with the developed world will increase. Emerging countries are likely to feel increasingly jealous and hostile toward rich countries while rich countries will try to isolate themselves from their poorer and embittered neighbours. This could heighten the tension in international affairs.

A few years ago, globalisation contributed to the narrowing of the gap between emerging markets and the Western world. Now it could be used as a channel for selling the products of Indigo economies to the countries that cannot compete in quality or

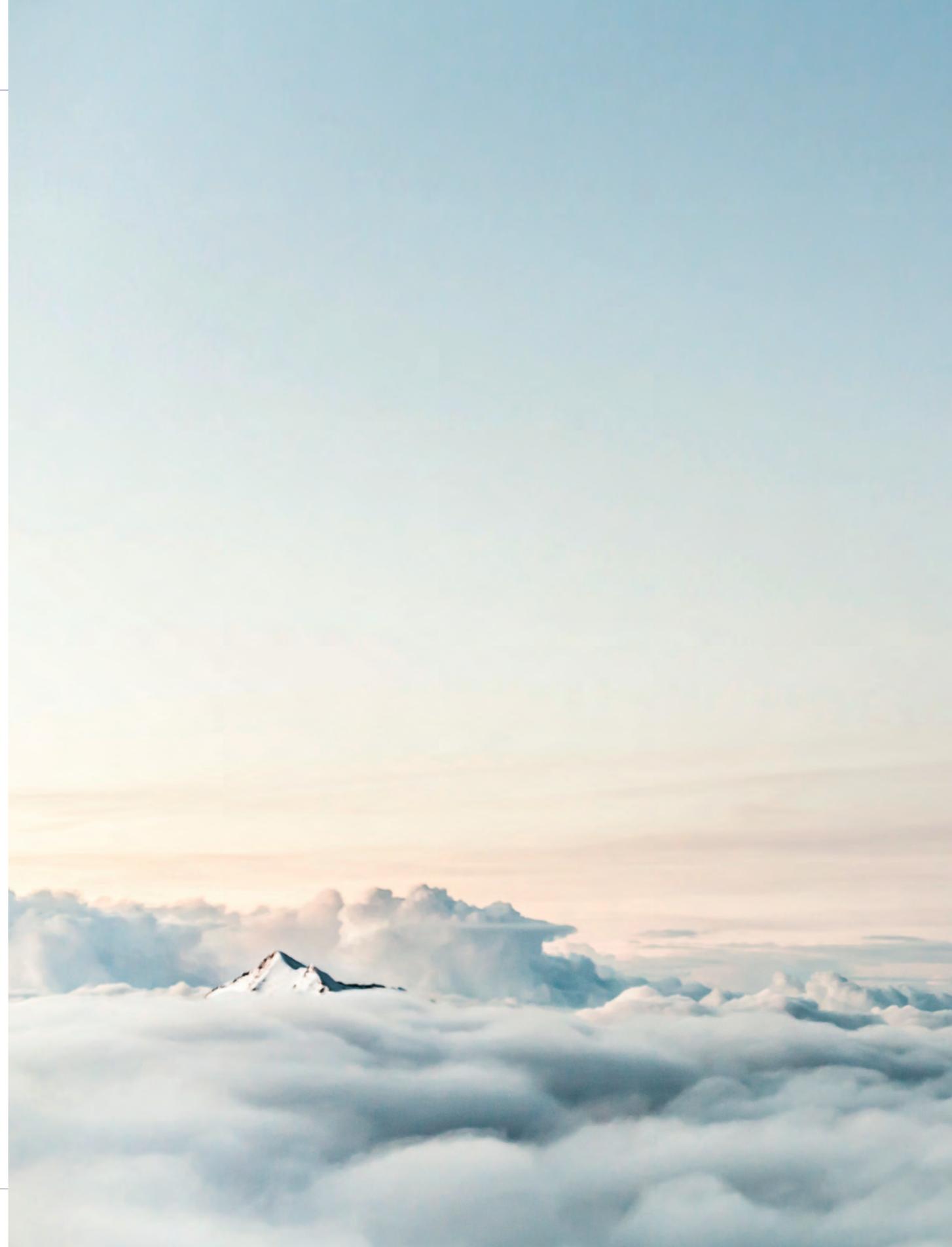
price. Heightened resentment and tension could further empower political populists who exploit the feelings of fear, jealousy and inability to change one's circumstances to fan hatred toward the more prosperous and successful, and a desire to destroy their riches. These populist politicians are already among us, promising simple solutions to complex problems. It is a dangerous recipe.

BUT THERE IS ALSO A RAY OF HOPE

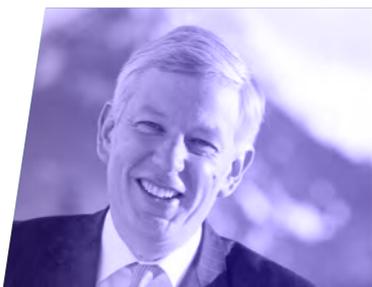
For two-and-a-half centuries it has been apparent that successful societies depend on having the rule of law, fair competition, and citizens' basic rights. The US was formed on this basis. As a student in the Soviet Union, I once explained the benefits of the socialist economy which, in contrast to the chaos of capitalism, could plan precisely how, when and in what quantity any goods had to be produced. The only problem was that these arguments were accompanied by endless lines for fast-disappearing food in shops. As a result, the socialist economic theory did not inspire much confidence in my listeners.

Nonetheless, the short-term economic successes of authoritarian and totalitarian regimes create a longing for a "strong hand" which can compel people to sacrifice their civil liberties for the benefits of economic security. But even in theory, one cannot build an economy based on the creative energy, free spirit and self-fulfilment of millions of individuals if they are cut off from making the most important decisions about their own society. I hope that the era toward which we are heading will finally end these dangerous misconceptions. The future Indigo economy is an economy of free people. And this means that the world will become more and more free.

Mikhail Fridman is an international businessman and entrepreneur. He is Co-Founder and Chairman of LetterOne, a global investment business that invests in the telecoms, technology, energy, health and retail sectors.



ADAPTING TO TURBULENCE



DOMINIC BARTON
GLOBAL MANAGING PARTNER OF MCKINSEY

Exploring the ways in which businesses need to adapt to the world economy, how we can counter the plague of short-termism, and exploring the role of governments and business leaders in adapting to the Indigo Era.

Q: Is this a moment of change in the world economy?

Yes. I think that the next 15 to 20 years are going to be some of the most exciting and disruptive in human history, and one of the biggest drivers of that is the technology shifts that are under way. Computing power, combined with connectedness, combined with data is enabling a tiny group of individuals to create massive amounts of value and disrupt established industries. People and ideas, not resources, will drive growth. This is an enormously significant shift to what Mikhail Fridman has called the “Indigo Economy,” and most of our institutions, global and national, are not ready for it.

Q: How is McKinsey preparing for this new world?

We are helping our clients get a sense of this new context and the implications for their business models, and of course we are having to take our own medicine, which is often painful. Traditional orthodoxies – how to manage, how to grow, who to hire and how to develop them – are now out of date. We are doing more business model transformation work than at any time in the last 30 years, and not just for failing firms, but increasingly for successful companies as well. We are also looking at sectors – oil and gas, banking and so on – and how their value chain might change, because disruption is often coming from outside of the sector, which is not what I was taught at school.

Q: So how has McKinsey changed?

Change is essential, but hard for us because we are still successful. But first, it’s the work we do – we’ve had to really re-think that. Our range of services has shifted 50 per cent in the last five

years. We are now, for instance, much more involved in cultural change and capability building. Then there’s the, ‘how we do it?’ It used to frustrate me that every issue or opportunity a client faced required McKinsey to spend three or six months with a project team with typically a couple of partners, a project manager and five people. Now we serve some clients with no people – literally it’s just software. Second, we now put dedicated people into organisations to run parts of them. We never used to do that. Third, we only used to serve big companies, now we have clients with only six employees. Fourth, we always used to charge for the time we took, now we are increasingly paid by results, by impact. Finally, and this is the most important, we have changed our approach to who we hire. It used to be just young graduates from business schools, now they are a minority. We’ve hired people who have run refineries, mathematicians, even this year one person with no university degree. So we are changing, but I worry it may not be fast enough.

Q: You’ve written about the plague of short-termism, but how do we solve it?

We look at it as a value chain – the hope is that we can shift the behaviour of so-called long-term money to actually act in the longer term. That’s what I love about Mikhail Fridman, he thinks long term. Another example is GIC, an institutional investor in Singapore, which incentivises its asset managers on not just a one-year basis, but on a five-to-ten-year basis. We’re also trying to meet with the boards of the top 500 companies by market cap globally, and do board education. So far we have only done that with seven, but it’s a start.



Q: Are the rewards from capitalism flowing to fewer people, and what do we do about it?

When Facebook bought WhatsApp for \$22 billion, the company employed only 55 people. This is not bad in and of itself, but it was indicative that we live in more of a ‘winner takes all’ world now. Right now, fewer people are capturing more of the rewards, and some people, countries and organisations – including McKinsey – are going to benefit more from globalisation than others. Government certainly has a role to play in managing rising inequality and displacement from technology and trade. For example, some countries might eventually consider moving to the idea of a guaranteed minimum income paid by the state. Tax policy may also need to change, for example through a 5 per cent Labour Dislocation Tax, with the money put into a fund to retrain people whose jobs are going to disappear as disruption gathers pace. Philanthropy is wonderful but not enough. If we don’t make structural changes, then we are going to have a French revolution.

Q: So will Asia and Africa wax or wane in this new world?

There are different factors pulling in different directions. By 2030 there will be 2.4 billion new middle class consumers globally, which will be a huge driver of growth and innovation. But at the same time no one has managed to completely mimic the creativity of Silicon Valley, which suggests that its unique success is rooted in institutions and culture which up until this point have been hard to replicate in Asia. Africa is also seeing a growth of the middle class, while they still need to build a lot of the infrastructure needed for growth. That

also means they are more open to new approaches, to leapfrog activity. On the flipside, while the education system in Singapore has been very successful – they have incredibly high PISA scores [Programme for International Student Assessment] – that very success makes change and innovation more difficult. Kenya or Rwanda could be in a stronger position to adapt to the new world. But emerging economies also need stable political institutions, the rule of law, an open culture, and these are not always easy to achieve.

People and ideas, not resources, will drive growth. This is an enormously significant shift to what Mikhail Fridman has called the “Indigo Economy”, and most of our institutions, global and national, are not ready for it.

Q: So how should governments go about adapting to the Indigo economy?

My biggest worry is that this is coming on so quickly that I am not sure the institutions – public and private, all around the globe – are ready for it. First, it’s about the right kind of education in the right place. McKinsey is doing some work in Mexico and four other countries right now where we believe we can get people ready for a job in three weeks. But in other countries it’s more about life-long learning, returning to education at different

points in your career to retrain and refresh. Then there is healthcare, where one of the biggest problems today is that regulation doesn’t always match what society needs. Some Chinese health experts are now arguing, for example, that you don’t need a doctor to perform heart surgery. That may panic us but they are saying, “No, we can have a super trained nurse’s assistant who has done it 150 times.” There are so many other aspects: for example, the legal framework around bankruptcies is incredibly important in making sure the capital is efficiently redeployed.

Q: What would be your message for other leaders elsewhere in the world. How should they navigate through this turbulent era?

One message is the idea of having a microscope in one eye and a telescope in the other. You need the microscope to be very focused on what’s happening right now because the world moves so quickly. But you also need to have a 20-year long-term telescope view because if all you do is focus on the short term, you could just wake up and find you are irrelevant. Secondly, at the end of the day it’s about talent. That’s been true throughout history but I think particularly now, in this Indigo world we are in. At McKinsey we spend a lot of time focusing on strategy, but ultimately I believe if we hire the right people then they will figure it out in the end.

Dominic Barton has been with McKinsey for 30 years, and has been its Global Managing Partner since 2009. He is Chair of the Canadian Minister of Finance’s Advisory Council on Economic Growth and Chair of the Seoul International Business Advisory Council. He was talking to Edward Amory.

INVISIBLE HAND OR CLENCHED FIST?



MICHAEL BLOOMBERG
FORMER MAYOR OF NEW YORK

As the world urbanises, cities must lead the way in tackling emissions. Vocational education reform is vital if we are to equip the next generation with the right skills they need to succeed.

For the first time in human history, the majority of people in the developed world are being asked to make a living with their minds, rather than their muscles. Across a growing range of industries – including those long considered blue collar – workers must analyse, create, engineer, design, code, write, and understand complex systems, leaving in many cases the actual ‘doing’ of things to robots, computers or workers in developing countries. Today, a strong back will only carry a career so far.

It’s not just the way we work that is undergoing a historic transformation. So too is the way we live. The gradual urbanisation of society that began during the Industrial Revolution is now reaching a climax. Today, more than half the world’s population dwells in urban areas, compared to only 20 per cent a century ago. In the next few decades, nearly 70 per cent will. Cities have triumphed, and they will increasingly shape the future.

These two global trends – in where we live and how we work – are complementary: each reinforces and accelerates the other. Cities have always been where innovation in science, technology, art and commerce collide, and where people go to pursue their dreams. Today, people who make a living with their minds tend to be attracted to a diversity of cultures and cuisines, faiths and philosophies, arts and ideas – and to places where all of this can be found within easy reach by foot, bike, or mass transit. It is no coincidence that the revival of so many urban areas in the US over the past two decades has come as knowledge and computer literacy have grown more central to the economy.

Together, the changes in how we work and where we live have the potential to reshape the world in profoundly positive ways, by improving health, reducing poverty, increasing education levels, expanding job opportunities, and promoting tolerance. But those benefits are threatened by monumental challenges that urban societies and knowledge economies present, and that local and national leaders must confront.

URBAN SOCIETIES

Rapid urbanisation poses a difficult question for cities: how will they accommodate the masses of people who flock to them? Answering it involves planning for, and investing in, new infrastructure of every kind: housing, transportation, energy, water, sewers, schools, and parks – and finding ways to expand each area in ways that improve standards of living without fuelling climate change. No small task.

In 2006, we set out to tackle it in New York by creating a long-term plan for the city’s future, called PlaNYC. Projections showed that New York City would add one million more people by 2030, straining our already old infrastructure and – if nothing was done – greatly increasing air pollution, including carbon emissions. Population growth is good for cities; it’s a sign of health. But failing to plan for growth can leave cities overwhelmed by it.

Fortunately, as we learned in New York, preparing cities for growing populations – by extending mass transit, building housing near transit links, improving energy efficiency, and expanding parks – also helps cities fight climate change. In fact, the measures that are most effective at fighting climate change also offer the most effective ways to improve



people’s health and quality of life. For cities, fighting climate change is less a burden than an opportunity. When I left office in 2013, we had reduced the city’s carbon footprint by 19 per cent, improved air quality to record levels, increased life expectancy by three years, and made New York a better and easier place to live and get around.

All cities face challenges from climate change – and like New York, most lie on coastal waterways, making them vulnerable to both rising sea levels and storms that are growing more intense, thanks partly to the warming oceans. As the world urbanises, it’s imperative that cities – which account for about 70 per cent of global greenhouse gases – lead the way in reducing emissions, while also adapting to climate change in order to protect their populations from more extreme weather. Failure to do so could have catastrophic consequences for urban populations and for the nations increasingly dependent upon them. Today, through my foundation and organisations like the C40 Cities Climate Leadership Group and the Global Covenant of Mayors for Climate and Energy, we are working to help cities tackle climate change and build more sustainable futures.

KNOWLEDGE ECONOMIES

Countries with education systems that emphasise science, technology, engineering and math, along with creative problem-solving and critical thinking, will be well-positioned to create and attract innovative companies and well-paid jobs. During my time as Mayor of New York, we launched an international competition that offered world-class universities free land and other incentives to build new campuses devoted to applied sciences. Today, Cornell Tech – a partnership between Cornell University in New York and The Technion-Israel Institute of Technology – is rising on Roosevelt Island, a stone’s throw from midtown Manhattan. We project it to create 8,000 permanent jobs and hundreds of new companies, but its greatest impact will be in helping to cement New York’s reputation in this new century as a global leader in technological innovation.

Attracting and incubating science and technology companies is critically important to cities’ futures, but not every student wants to become an engineer or astrophysicist – and some have little interest in college. When I was growing up, a high school diploma was

enough to qualify for a factory job that came with a ticket into the middle class. Today, not only have manufacturing jobs shrunk, they require skills that many US high schools aren’t teaching.

When people feel powerless to take control of their future, the possibility of violence and revolution increases, as history has shown time and again.

The same is true for many other industries that traditionally haven’t required a college degree. Most vocational programs are based on an economic model that is decades out of date, and, making matters worse, the programs are often stigmatised and considered appropriate only for those who struggle academically.

Our failure to arm students with the skills they need to enter the middle class consigns too many of them to a lifetime of unemployment and low-wage jobs.



That is a tragic waste of human talent that can have terrible consequences not only for the individual – including a greater risk of drug addiction and suicide – but also for their families. And it presents serious risks to a nation’s growth and stability.

When people feel powerless to take control of their future, the possibility of violence and revolution increases, as history has shown time and again. The market’s invisible hand can appear to be a clenched fist to those without the skills and knowledge to earn a decent living and attain opportunities for advancement – unless elected officials and business leaders, working together, offer them a hand up. My foundation is part of that work, by helping to bring businesses and education leaders together to overhaul, modernise, and expand vocational training in places like New Orleans and Colorado – something we had focused on during my time in City Hall.

The market’s invisible hand can appear to be a clenched fist to those without the skills and knowledge to earn a decent living and attain opportunities for advancement.

One of our approaches to re-thinking vocational education in New York has since been adopted as a national model: extending high school by two years and allowing students to earn a college associate’s degree. For instance, we created a six-year school in partnership with the City University of New York and IBM, which concentrates on computer science. IBM provides mentors and internships to students – and graduates are first in line for interviews at the company. We also created six-year schools focused on other growing industries, including clean energy and healthcare.

Shifts in how we work and where we live present difficult challenges that will require new thinking, new approaches, and new resources.

More non-traditional schools like these are necessary to give students opportunities to learn the skills they need to succeed in the workplace. Pairing high school students with apprenticeships in advanced manufacturing, biotechnology, information technology, graphic design, and other fields can help them acquire marketable skills and introduce them to industries that often lack qualified workers.

Shifts in how we work and where we live present difficult challenges that will require new thinking, new approaches, and new resources. Adapting will not be easy, but cities have every incentive to lead the way – and those that do will reap great rewards. A future driven by cities and powered by knowledge holds unlimited potential for improving lives, but we must ensure that all people have opportunities to contribute their talents – and share in the benefits.

Michael Bloomberg is the Founder of Bloomberg LP and Bloomberg Philanthropies and a three-term Mayor of New York City (2002-2013).

WE NEED A NEW PROGRESSIVE ERA OF RENEWAL



STAN GREENBERG
POLITICAL STRATEGIST AND
DEMOCRATIC POLLSTER

Nearly 60 per cent of millennials believe we need radical change, not just incremental change. Understanding and combatting the disconnect between the elite and average people will be absolutely vital for re-establishing trust in the Indigo Era.

Q: What’s your view on the global changes we are facing, most notably the shift towards human capital and creativity?

I think this rhetoric is very real, and will be at the heart of the changes we face over the next few generations. But what needs attention is how people will respond to these shifts, and in particular, the necessary use of democratic institutions to mitigate the effects of these changes. I explain in my book ‘America Ascendant’ how the Industrial Revolution generated vast growth and productivity, which was largely concentrated in the US, because the US experienced 100 years of unregulated immigration and urban expansion. But following this, it produced a two-decade long period of reform to mitigate the effects of these drastic changes. At the heart of this was breaking the bond between politicians and big businesses to regain the trust of the American people, which then led to a cascade of progressive policies, such as restraints on monopolies, reduced tariffs, the income tax, women’s suffrage, the eight-hour working week in interstate commerce and women’s working conditions, that Woodrow Wilson called ‘The Progressive Era of Renewal.’

In our era we are seeing a similar story play out, due to unprecedented immigration rates and vastly improved education systems, which have helped create a new period of innovation. But just as the US did after the Industrial Revolution, we now need the correct processes in place to mitigate these global changes.

Q: Given the rise of Donald Trump and similar characters across our political systems, is the democratic process actually exacerbating the problem, rather than mitigating it?

Trump did better than he deserved to do, because the way the American constitution functions means rural areas tend to be dramatically over-represented. This is at a time when the Indigo Era is driving more and more people into the cities. For example, two thirds of millennials with a regular college degree have moved to the largest 50 cities in the US. And while Obama won 26 of the 30 largest metropolitan areas and over three quarters in the urban core, the Democratic party’s electoral impact is dampened by the way the US Constitution works. Eventually, the political system will have to catch up with the demographic changes we’re seeing.

Q: Would you say that at the heart of the mitigation process must be the breaking of ties between politicians and businesses?

Yes, and I think millennials play a big part in that. Recent figures showed that nearly 60 per cent of millennials believe we need radical change, not just incremental change. With so much distrust of corporations, banking and Wall Street, young people react against a political process they have come to view as corrupt. Their demand to clean up money and politics reminds us of the demand for reforms that changed America a century earlier. Millennials are engaged and they are the most optimistic about what

the future brings. That is why I'm so optimistic about America.

Because Europe has failed to develop a formula for migration that works, it is unable to come to terms with globalisation.

Q: How does this all play out in Europe?

Take immigration as an example. Globalisation makes itself heard in growing migration, and one in five migrants in the world are in the United States. There, Trump gained support among the anti-immigrant Republicans because he was the only candidate willing to make immigration his highest political priority. While all the other candidates were shying away from this issue, Trump had nothing to lose and so used inflammatory rhetoric about the threat, and thus he owned 'the immigration issue.'

The US is the only country I know that has a framework for dealing with its growing immigration and diversity. In Europe, I don't think there is any country where a politician can say, "We are a multicultural country and our goal is to build our future around that identity."

I believe immigration was the main reason that the Brexit vote won the EU referendum. I battled over a long number of years working for Labour, working with Tony Blair through three General Elections, trying to get them to deal first with asylum seekers and then immigration. I also tried with Gordon Brown, and with Ed Miliband who struggled to get support delivering a major speech on immigration through his entire five years. I have seen no European leader able to address the immigration issue in a way that wins public trust or wins electoral support. There are also two very different demographic dynamics in the US and

Europe underpinning this difference. In the US electorate, the millennials are the fastest growing group and are also driving the overall culture, while in Europe the vote is still dominated by older generations. So because Europe has failed to develop a formula for migration that works, it is unable to come to terms with globalisation, and that is a problem for its future, but not necessarily for the world as a whole.

Q: In a time when the globe could enter a new golden age or alternatively take a darker course, what is the role of leaders in navigating that choice?

Well I've spent my life trying to help with transformative leaders, including the likes of Bill Clinton, Tony Blair and Nelson Mandela. Mandela is the leader who has taught me the most about leadership. I think Clinton and Blair would say the same. I spent a sustained amount of time with 'Madiba' in different periods of his struggle to bring change. He was always learning, humble when he needed, respectful of opponents, balancing many goals, so I came to appreciate the complexity of him as a person, and that contributed to his success. He could adapt when others couldn't, he had flexibility in tactics, but never in values. As he made the transition from freedom fighter to party leader to president, his national project changed dramatically, but his values never wavered. Above all, he was able to persuade citizens who didn't share his history or background, or approve of his policies, to trust him enough to make a new national compact. Many ANC leaders were sceptical, but the electorate trusted him completely.

Q: So what can we learn from him?

I learned about how a leader builds a trusted relationship with citizens. Mandela lectured his constituents on their responsibilities as citizens, but he also lectured other leaders on their obligation to "make a better life for all." He was a complicated, educative leader who did not pander but who always worried out loud, "How does it impact the poorest?"

Right now, there is a huge elite distrust problem around the world. Economic and political elites are now seen to be allied, without a real understanding of what is happening in the lives of ordinary citizens. In Britain when Labour was in power, the political class was seen to be living in its own world and lost touch. And part of the reason for Brexit was a reaction against the elites that were out of touch. It is the same story in the US. Bernie Sanders and Trump did relatively well in their party primaries because they attacked the elites who were losing track of the average voter. In the US, millennials believe the system to be corrupt due to the tight bond between money and politics. Immigration affects ordinary people and is riling politics everywhere.

Economic and political elites are now seen to be allied, without a real understanding of what is happening in the lives of ordinary citizens.

Above all, it's because the elites are comfortable with globalisation and migration, and aren't thinking about what this means for the average person. So when we think about leadership, and how it will navigate us through the Indigo Era, understanding and combating this disconnect between elite and average people will be absolutely key to re-establishing trust.

Stan Greenberg is a leading Democratic political strategist who was the senior pollster for Bill Clinton, Tony Blair and Nelson Mandela. Stan is CEO of polling and consulting firm Greenberg Quinlan Rosner, and Co-Founder of non-profit political strategy firm Democracy Corps. His new book, 'America Ascendant', likens the current period of change to the Industrial Revolution. He was talking to Edward Amory.



OUR CONNECTED WORLD:

Risks and Rewards



CARL BILDT
FORMER PRIME MINISTER OF SWEDEN

We need to have an inclusive global digital economy, but half of the world's population remains offline. Politicians and policy-makers need to encourage free access in order to help as many people as possible get connected. But with connectivity comes risk. We need new human rights for digital citizens.

In 1994, when I was Prime Minister of Sweden, I sent the first e-mail between two heads of state.

I had been discussing with Al Gore the development of what people at the time called “The Internet Superhighway.” So I thought it would be a good idea to send an e-mail to President Clinton. There weren’t many connection hubs in Sweden, but we found one in Stockholm. I managed to send Bill Clinton an e-mail to congratulate him on ending the trade embargo with Vietnam – the first digital message between two heads of state.

We waited for a reply, but we didn’t hear back at all. After several days one of my staff called the White House to ask if they had received it. It turned out that they hadn’t connected the system yet!

At the time e-mail was seen as revolutionary; it was the year the first commercial web browser appeared.

Technology can be an enabler, but it can also create divisions. The primary division I see is generational. Young people around the globe are making new virtual connections with each other using new systems, apps and structures, while many of their parents barely understand what their children are doing.

We need to have an inclusive global digital economy, but half of the world’s population remains offline. Politicians and policy-makers need to encourage free internet access in order to help as many people as possible get connected.

This will become easier as internet access depends less on physical

infrastructure and more on digital infrastructure. Within five to six years, 90 per cent of the world will be covered with mobile broadband networks of the same or better quality than we have in most of Europe today. But we need to make it affordable as well, and this comes through competition, rather than monopolising, old-fashioned telecoms structures, as can happen in corrupt regimes. The main things that are important are a benevolent regulatory environment and openness to competition, which drives down prices.

Sweden is a clear example of the ability of competition to drive prices down. We implemented a fairly radical deregulation and privatisation programme across the telecoms sector in the early 1990s, and we now have one of the best internet frameworks in the world.

You might argue that we already had a strong foundation in technology. But when I look at Africa, I see countries whose economies are developing slowly due to government monopolies on telecoms, often associated with ingrained political interests – and the result is often very high prices.

The most extreme example of cheap connectivity is Somalia, which has virtually no regulation and amongst the lowest prices for mobile communications in Africa. This is because quite a number of operators and private entrepreneurs have been going into Somalia and setting up networks. Since people need to communicate even in difficult situations, demand has been great, making it very cheap to get connected.

Another example of a country that has been very successful in digital connectivity, perhaps surprisingly, is Afghanistan. Fifteen to twenty years ago it had virtually no connectivity whatsoever. Today it has reliable and good mobile communications everywhere, which facilitates economic, political and social development in a profound way.

This is largely thanks to broad connectivity infrastructure, such as the fibre optic cables under the oceans that connect continents and tie nations together.

The new Indigo generation that will make up our future workforce and economy will live in a truly digital society, and many sectors will be forced to adapt accordingly. One example of a sector that has been transformed is the music industry. Once upon a time we had vinyl records, then we moved to CDs (which have virtually disappeared now), and now music lives and is shared in the cloud.

It’s a similar story with the media industry: the average age of a print newspaper reader in Sweden is 72! The paper and pulp industry has always been big in Sweden, and we have traditionally provided much of the paper for newspapers all over Europe. We have now had to close down much of this production in Sweden and Finland, as the demand for newsprint has gone down as media has become digital.

On the other hand, Sweden has managed to harness evolving

technologies, making it a hub for entrepreneurship and growth, due to a number of different factors. We pride ourselves on being an economy that’s very open to the outside world – both in terms of trade, and in terms of people coming in. Migration has certainly been a large factor in our success. Migrants have been very important in bringing a new impetus and a fresh dynamism to the Swedish economy. We are a small nation – 10 million people isn’t much in a world of 7.3 billion – but we have the likes of Ericsson and Volvo. Our agility in adjusting to new changes in technology and our openness, not only to ideas but to talented individuals arriving from abroad, has allowed us to produce very impressive global corporations, despite being a relatively small nation.

These factors are not unique to Sweden, however many of them can be replicated. Estonia, for example, is also very small – 1.3m people. 25 years ago they were nowhere – but they are now starting to become one of the leaders in the use of digital technologies, particularly in e-government and security.

The other nation that has been very impressive in this area is South Korea. It has had a very determined policy of digitalisation. It is the most connected society in the world today, with very high internet speeds, and its vigorous entrepreneurial environment is producing lots of successful apps and new corporations. Many of them are not yet known in Europe but they are becoming big Asian brand names.



Estonia is very small – 1.3m people. 25 years ago they were nowhere – but they are now starting to become one of the leaders in the use of digital technologies, particularly in e-government and security.



But with connectivity comes risk. In the Internet Governance Report I discuss how the future of the internet hangs in the balance. The internet isn't just about opportunity. It can also unleash dangerous new forces on the world: malicious data breaches, uneven and unequal financial gains, and cybercrime. It can also allow unscrupulous governments to manipulate their citizens in new ways.

To combat this, we call for human rights for digital citizens. The UN Declaration of Human Rights was written before the digital age. That applies to freedom of speech, freedom of information, the right to be respected, and the right to privacy.

We need fairly strict laws regulating when the legal authorities of a country should interfere with people's private lives, which sometimes happens for legal reasons to uphold the rule of law. We also need to extend the rule of law to cyberspace, to ensure that our legal systems are as fit for purpose online as they are offline. Innovation and growth require legal certainty, not the Wild West online.

Ultimately, I'm optimistic about the way in which technology and the opening of borders are transforming our world for the better. But I am also worried by the rise of the resulting tensions within societies facing change and disruption – the Brexit vote is one expression of that.

We [the Swedish] pride ourselves on being an economy that's very open to the outside world – both in terms of trade, and in terms of people coming in: migration has certainly been a large factor in our success.

There is a real risk that political disenfranchisement in the United States and across Europe could have negative effects on our economies and political structures. Since the Industrial Revolution we have continually come up with ever more creative ways to change the world through technology. However, each new generation must rediscover how to channel these changes for the good of all.

Carl Bildt is a Swedish politician and diplomat. He served as Prime Minister of Sweden, and Sweden's Minister for Foreign Affairs, proving instrumental as a mediator in peace talks between Bosnia and Herzegovina and between Serbia and Kosovo. Since 2014, Bildt has served as Chair of the Global Commission on Internet Governance.

CREATIVITY: *The New Industrial Strategy*



SIR VINCE CABLE
FORMER UK SECRETARY OF STATE FOR
BUSINESS, INNOVATION AND SKILLS

Developing a new industrial strategy that has creativity and creative industries at its heart requires a focus on a particular set of policy interventions, including flexible Intellectual Property rights, transferable skills, and financing fast-growing industries.

A few days ago I visited a medium sized car components manufacturing company in Germany. I toured the apprenticeship training school at the plant (and, this being Germany, there were a lot of apprentices and they had serious training). On the wall was a large slogan, 'Wissen ist begrenzt; kreativität ist unbegrenzt' (knowledge is finite; creativity is infinite). These school-leavers were being taught that their jobs, and the company's future in a competitive world, depended not on their ability to master defined tasks but to think creatively about design, quality improvement, process innovation, and working methods and systems. Failure to do so meant that the company would fail or their jobs would be shipped out to Eastern Europe, Turkey or China.

My own experience in the oil and gas sector, before joining the political world, was similar. Gone were the days when the only things that really mattered were access to owned (equity) oil, refining it and selling it. The future came from value addition through creative management of complex projects, innovative technology and the ability to plan ahead.

And when I put into place in government an 'industrial strategy' it was clear that creativity had to be at the heart of it. A rigid approach to sectors based on past stereotypes was not helpful. Some 'dying' industries were enjoying resurrection thanks to creativity in design and production methods; for example textiles and garments are on-shoring again albeit on a small scale. Britain lags well behind Germany in mass-manufacture of motor vehicles but is well ahead in Formula 1 creative design and manufacture which has become an important niche specialism.

And at the centre of industrial strategy are creative industries. These can be loosely divided into those concerned with information and communication, from software coding to systems design; telecommunications; the development of 'z platforms' and the Internet of Things – and those built around content-advertising, architecture, apps, fashion and design, computer games, music, film, photography, TV, publishing, educational aids. Boundaries are fuzzy and fluid. Creative industries merge into those professional services, such as law, accounting and engineering which at the creative end are internationally traded (especially by the UK) but also have a commoditised component, which increasingly will be subsumed within automated systems.

Developing an 'industrial strategy' that has creativity and creative industries at its heart requires a focus on a particular set of policy interventions, which are somewhat different from those that apply to extractive sectors or mass-manufacturing. The first is a strong but flexible regime for intellectual property rights. Patents have, of course, long been important for the manufacturing industry. Copyright is also crucial for creative industries, with an efficient legal system and tough enforcement in the face of theft but also sensible exemptions (e.g. individual rather than industrial copying). Copyright reform was an important element in the UK approach to creative industries and in the attempts to build a digital single market. It is also striking that IP has been a central issue in recent trade negotiations (as in the Uruguay Round that led to the creation of the WTO) and in bilateral commercial arrangements (as with China). A second area of importance is skills,



As someone who believes in the merits of an open society and open economy, and who believes that economic globalisation has been overwhelmingly a force for good, I have to believe that these forces will triumph.

including transferable skills. We must recognise that many of today's skills will be obsolete within a decade and labour demand, then, will be in fields we cannot currently imagine. Creativity is also difficult to teach. It may even be antithetical to traditional pedagogy, which emphasises memory of facts or the mastery of set routines. School curriculum has to incorporate basic literacy and numeracy to a high level. But it must also contain a balance of subjects which allow for lateral thinking, performing arts, the use of emotional intelligence and cross-over disciplines like design which incorporate both 'art' and technology. In the UK, creative industries bodies like Creative Skillset were established to promote such principles up to the level of work-based training.

A third area is financing, since industries based around intellectual property may not have physical collateral to pledge to lenders. Moreover, technology is unpredictable and disruptive and the system has to allow for substantial, but healthy, corporate failure. The UK's concentrated and property-based system of bank lending has been seriously unsuited to this kind of world. Work has had to be done, for example via the British Business Bank, to accelerate peer-to-peer lending and other crowd funding techniques along with 'fintech' innovation in general. There is a

substantial synergy between successful creative industry and an innovative, sophisticated, financial services sector, if the latter is allowed to develop.

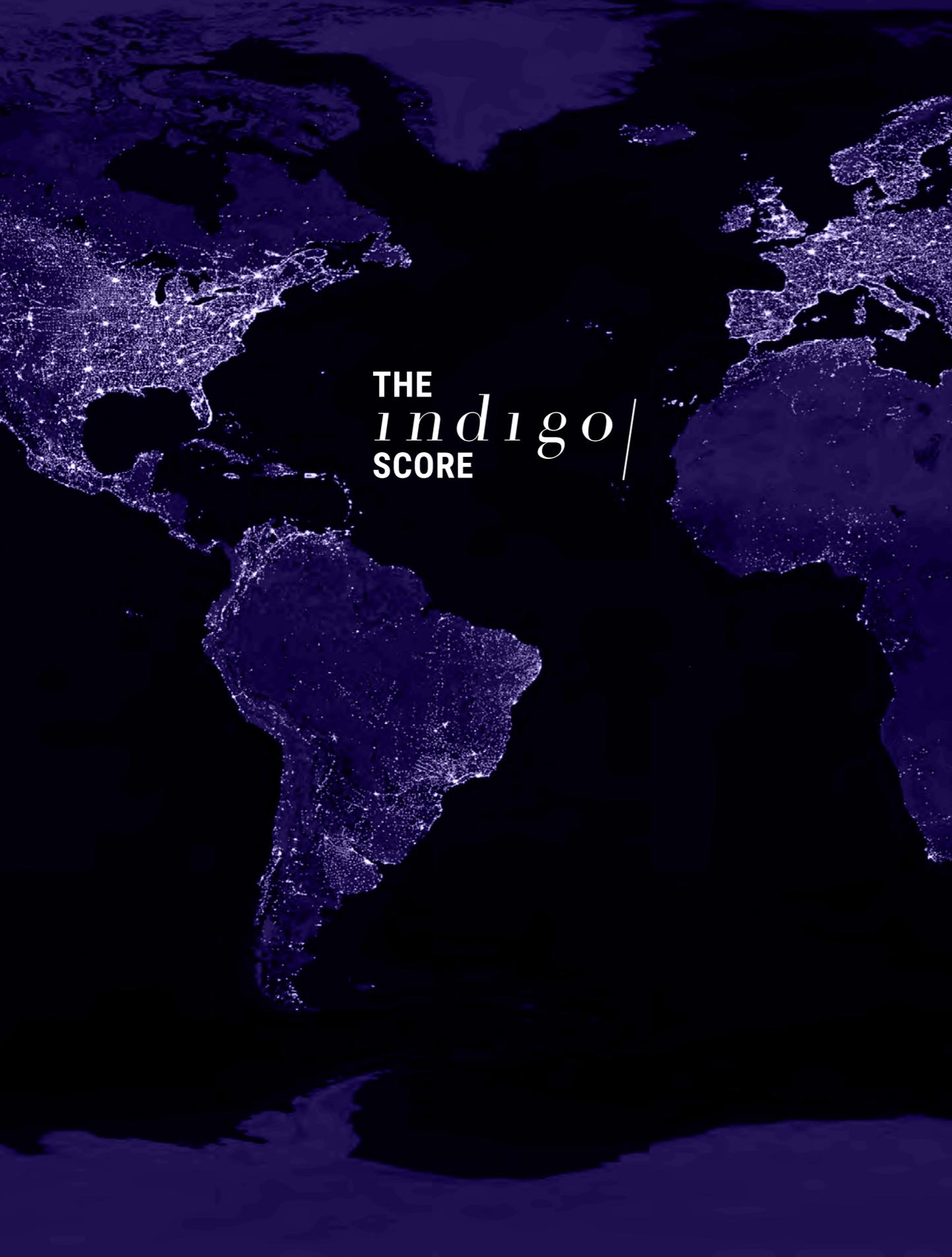
Fourth, there is the issue of how to develop strong creative industries nationally but within a framework of international rules and dispute settlement. As already noted, IP rights have already become a substantial issue in international trade negotiations. We have seen clashes over the film industry (Hollywood versus European language protection) and the emergence of Bollywood and the Chinese equivalent is adding to the market place. The European Digital Single Market is an attempt to deepen integration in the sector. However, even before the British Brexit vote there were serious differences emerging over issues like privacy or whether to treat the big internet platforms, like Google, and new disruptive firms, like Uber, as a threat or an opportunity. And trans-Atlantic cooperation is already being badly dented by arguments over tax, which are inevitable when trade in electrons within companies rich in intangible assets – brand value or copyright – makes it so easy to manipulate accounts to minimise tax obligations.

There is also a deeper problem: creative industries provide content that is often highly contentious when it involves countries with different cultural norms and different political systems. The globalisation of creativity is crashing up against serious barriers. The new Chinese Great Wall is not primarily designed to create a competitor for Google, though that may be one motive, it is primarily to filter out information and analysis that threatens the Communist Party leadership. Other authoritarian or semi-authoritarian countries – North Korea, Iran, Saudi Arabia, Russia, Turkey, the Stans – are creating an environment in which it is difficult for independent-minded, educated people to operate creatively. Barriers are going up and conflict is being engendered.

As someone who believes in the merits of an open society and an open economy, and who believes that economic globalisation has been overwhelmingly a force for good, I have to believe that these forces will triumph; but there are some powerful counter-currents right now.

Sir Vince Cable is a British politician and former Secretary of State for Business, Innovation and Skills. Prior to entering politics, he served as the Chief Economist for Shell.





THE *indigo* SCORE

We can no longer predict the future economic performance of countries just by forecasting GDP, since it is a measure of the combined activity of millions of people, influenced by many changing socio-economic factors. Our global economy is changing rapidly and the future does not look like the past.

In this new economic era, the main source of a nation's wealth is not the resource rent but the social infrastructure that allows every person to realise his or her intellectual and creative potential.

In order to gauge a country's ability to compete and grow in this new economic era, it is vital to look at a range of broader socio-economic infrastructure such as; the levels of education, the 'cloud' or infrastructure for doing business, its legal system, physical and intellectual property rights, competitive environment, political stability, digital infrastructure, and the ecosystem of thousands of suppliers that can provide high-quality services ranging from venture financing to marketing and web design.

To assess a country's future potential we have developed - The Indigo Score - which provides some insight into the current state of a country's socio-economic infrastructure that will shape, and influence, its economic performance in the new Indigo Era.

The score is based on five measures:

Stability & Legal Framework - including Political Stability Index, control of corruption, government effectiveness, regulation quality and Fragile States Index

Economic Diversity - including natural resources rent, patent applications, intellectual property rights, trademark applications and Economic Diversity Index

Creativity & Innovation - including measures of expenditure on education, adult literacy rates, tertiary education, Global Creativity Index and investment in R&D

Digital Economy - including ICT exports, mobile subscriptions, internet users and global connectivity

Freedom - including measures of press freedom, democracy ranking and Democracy Index

THE SCORE METHODOLOGY

The score uses over 30 measures from a wide range of published data sources, including the World Bank, UNESCO, CIRI Human Rights Data Project, Center for International Development at Harvard University and the Global Education Monitoring Report. Each of these measures was used to determine the score for one of five factors, detailed above. Once these five scores were determined for each country, they were amalgamated to form an overall Indigo score.

The score represents an average figure for each of these five key measures. An overall score of 100 is equal to the global average. A very high score is around 170, while a very low score is around 40. The final index includes the 152 countries for which sufficient data could be gathered for analysis.

KEY FINDINGS

Creativity & Innovation is king

The Indigo Score shows that the most creative and innovative economies have the highest scores and hence greatest chance of prosperity. Creativity & Innovation is a key driver of the overall score, with the top five countries scoring exceptionally highly in this area. Countries that foster entrepreneurialism and lifelong learning, and invest heavily in people, are those that we expect to thrive the most.

The Nordic region's future is bright

The Nordic countries are particularly well-prepared for the future global economy, with three Nordic countries (Sweden, Finland, Denmark) scoring in the top five. This is attributed to their very high scores for Creativity & Innovation as well as Freedom, which are strong drivers of the overall score.

Low scorers are burdened with social and political problems

The countries with the lowest chance of prosperity in the coming era are affected by significant issues such as war, political turmoil and corruption. These issues are so serious that these countries may be unable to fully develop their economies and establish the institutions necessary to underpin their growth. For example, Syria is third from bottom with a score of 19.2 (average global score = 100), while Iraq is in second last place with a score of 19.0.

INDIGO SCORE RANKING

TOP 25 COUNTRIES

It is perhaps not surprising that many of the top ranked countries are the most well developed economies of the world.

The Nordic countries, all being in the top 10 (and 3 in the top 5), largely lead the way.

The Nordic countries are followed closely by the UK, which comes fifth in the world overall. The UK scores well in terms of Economic Diversity and its Digital Economy but relatively poorly in terms of stability, when compared to other rich developed nations.

The Asia-Pacific region is represented in the top 25 by Japan (9th), Australia (10th), Singapore (15th), New Zealand (19th) and South Korea (23rd).

Again, while these countries score highly across most dimensions, there are certain aspects that stand out as relative positive or negative influences on their overall Indigo Scores – for example:

- › *Japan rates as the strongest country in the world for Economic Diversity*
- › *Singapore rates first in Digital Economy but below the global average for Freedom*
- › *New Zealand sees its overall score adversely impacted by relatively weaker performance in Creativity & Innovation and Digital Economy*
- › *South Korea is adversely impacted by weaker performance on Stability and Freedom*

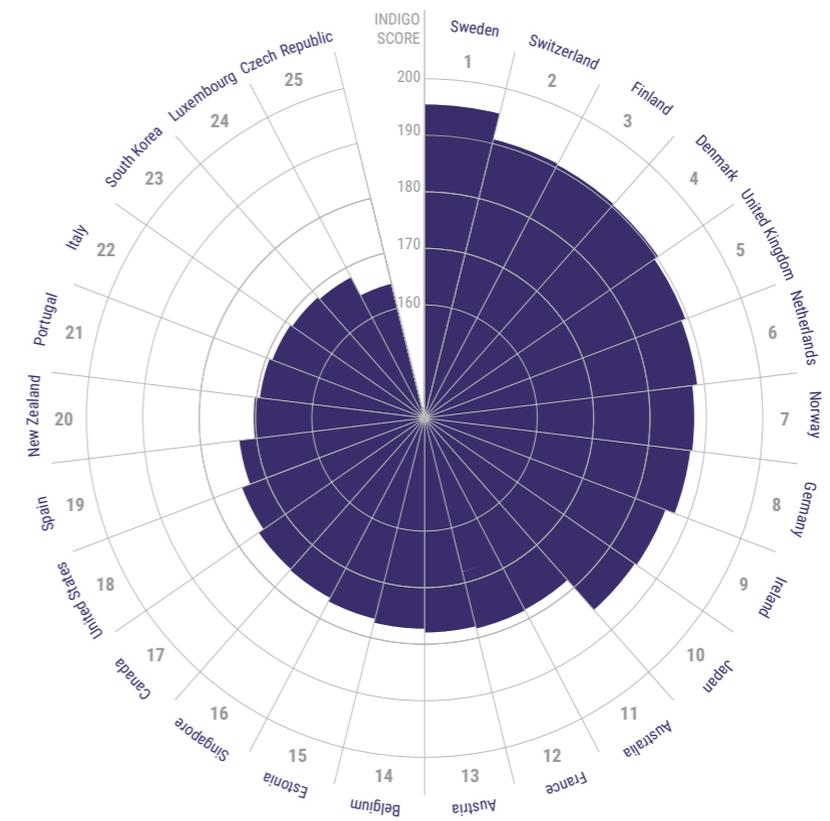
Perhaps the most surprising entry in the top 25 is Estonia, which ranks 15th. It has a history of occupations over the centuries, but seems to be flourishing as a modern democracy. It has become well known for its grasp of technology and its education system, and these are certainly very positive influences on its Indigo Score.

BOTTOM 25 COUNTRIES

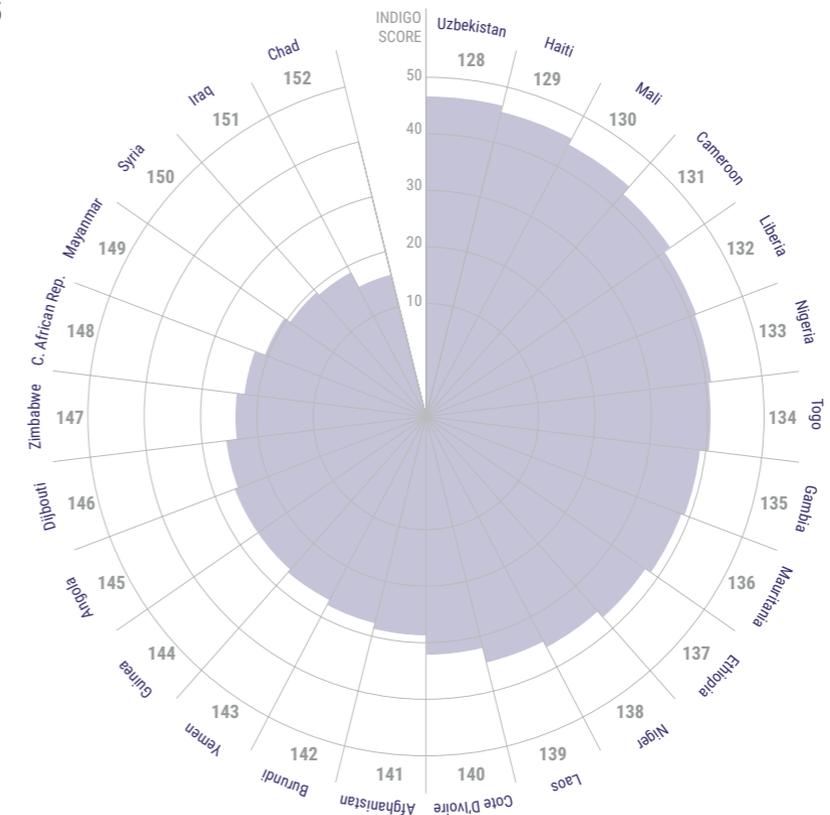
The countries that rank lowest are beset by significant issues – wars, political or ethnic violence, dictatorships, corruption, famines, refugee crises, mass migrations and so on.

The data suggest that the issues facing these countries are inhibiting their progress, and hence they score lower on the Indigo ranking.

TOP 25



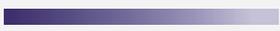
BOTTOM 25



▷ Please refer to page 35

THE *indigo* SCORE

RANK 1 - 152 /

HIGH SCORE  LOW SCORE

INDIGO RANK
TOP 5

01

Sweden
195.9

02

Switzerland
190.7

03

Finland
190.6

04

Denmark
190.4

05

UK
189.0

RANKED 1ST
FREEDOM

Norway
210.4

JAPAN
JAPAN SCORES RELATIVELY
LOW ON FREEDOM AND
CREATIVITY & INNOVATION

Overall Japan rank
10

RANKED 1ST
ECONOMIC DIVERSITY

Japan
204.5

RANKED 1ST
DIGITAL ECONOMY

Singapore
200.6

RANKED 1ST
STABILITY & LEGAL

New Zealand
195.8

RANKED 1ST
CREATIVITY & INNOVATION

Slovenia
232.2

SWEDEN
SWEDEN SCORES HIGHLY
ACROSS ALL DIMENSIONS, BUT
PARTICULARLY SO IN CREATIVITY
AND INNOVATION & FREEDOM

Overall Sweden rank
01

COSTA RICA
THE HIGHEST RANKING
CENTRAL AMERICAN COUNTRY:
HIGH SCORES FOR DIGITAL
ECONOMY & FREEDOM

Overall Costa Rica rank
34

ESTONIA
CREATIVITY & INNOVATION
WAS THE KEY POSITIVE DRIVER
FOR ESTONIA'S HIGH RANK.

Overall Estonia rank
15

INDIGO RANK
BOTTOM 5

148

Central African
Republic
22.3

149

Myanmar
20.8

150

Syria
19.2

151

Iraq
19.0

152

Chad
16.3

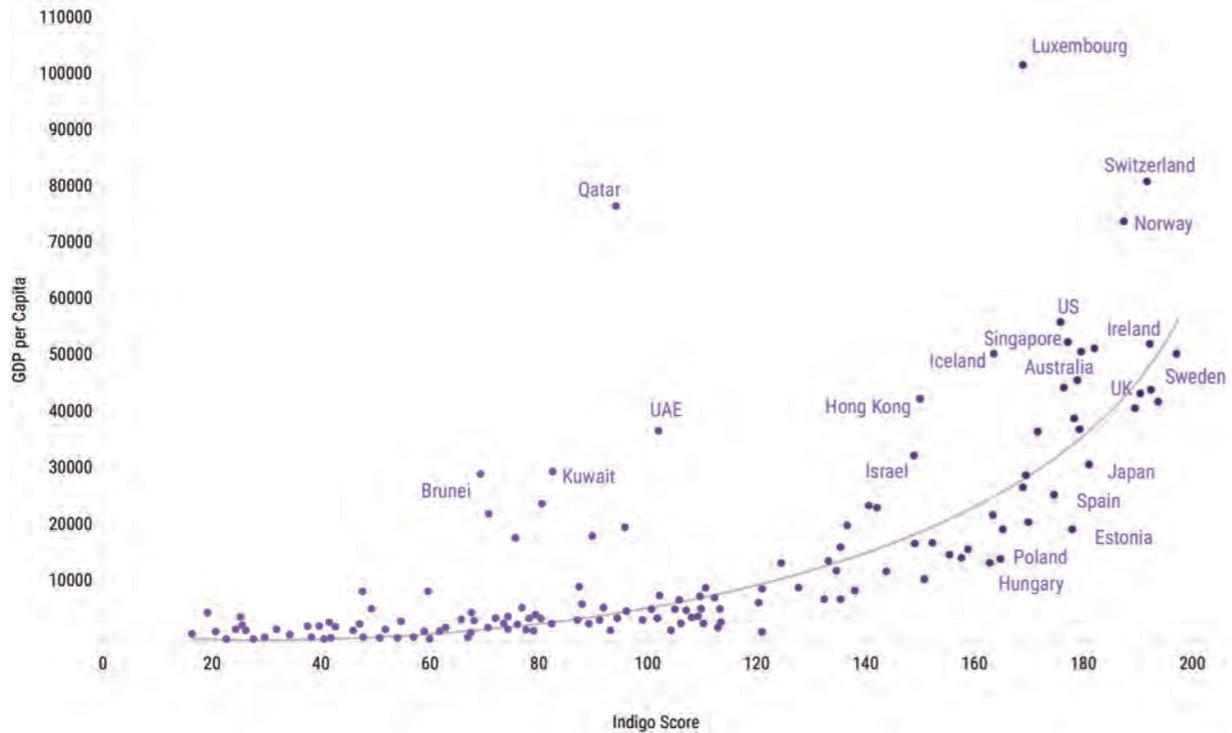
INDIGO SCORE vs GDP PER CAPITA

TOP 20

There is a strong link between the Indigo Score and GDP per capita, with a high correlation coefficient of 0.7.

The relationship is exponential – as the Indigo Score gets higher, the differential in GDP per capita gets ever wider.

At an Indigo Score of 100 (the global average), we would expect GDP per capita to be US \$5,462.



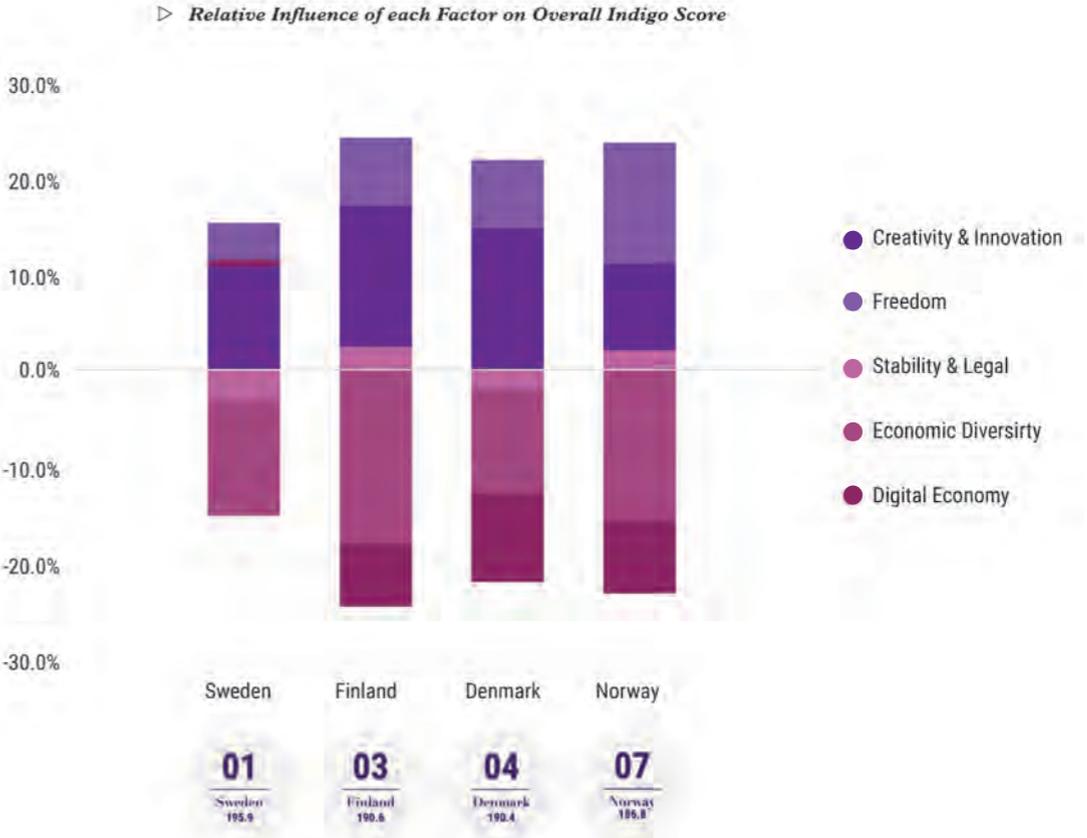
INDIGO SCORE RANKING

NORDIC COUNTRIES

The Nordic countries are well known for their freedom and economic stability.

Nordic countries perform consistently well across all dimensions and all rank in the top 10.

Relative to their very high scores across all dimensions, it is Creativity & Innovation and Freedom where they are most positive, while Economic Diversity is not quite as strong (but still very strong relative to other countries).



INDIGO SCORE RANKING

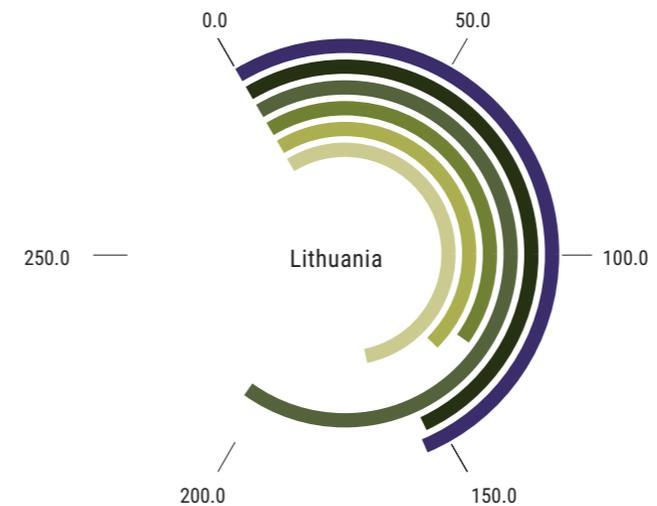
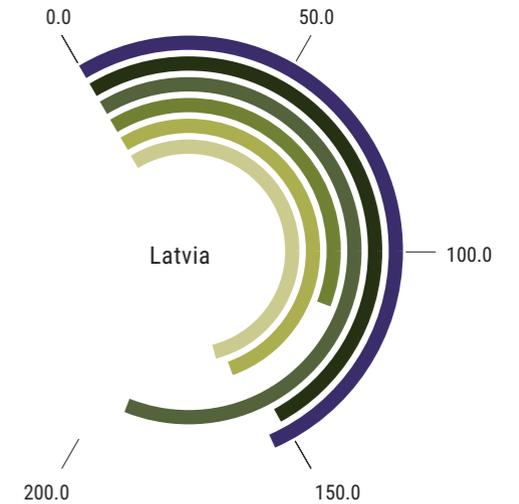
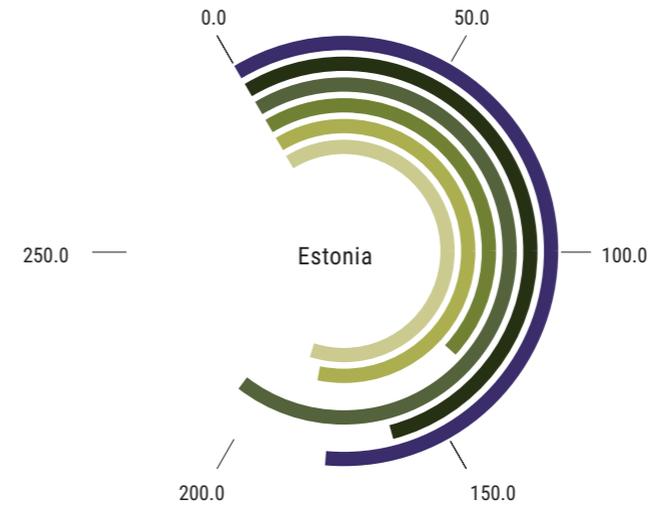
BALTIC STATES

We have already noted how highly ranked Estonia is (15th), but the other Baltic states of Latvia (32nd) and Lithuania (30th) also have strong Indigo Scores.

Their profiles are very similar across the key dimensions of the Indigo Score, with Creativity & Innovation being the key positive driver, while Economic Diversity pulls their scores down (though still strong on a global basis).

All three countries have come a remarkably long way in past few decades – and possibly embody the core themes of the Indigo Score more than any other country.

	Estonia	Latvia	Lithuania
Indigo Score	189.3	217.2	172.9
Stability & Legal	193.2	212.1	183.7
Creativity & Innovation	195.3	218.2	156.4
Economic Diversity	189.3	217.2	172.9
Digital Economy	193.2	212.1	183.7
Freedom	195.3	218.2	156.4



- Indigo score
- Stability & Legal
- Creativity & Innovation
- Economic Diversity
- Digital Economy
- Freedom

CURED BY CREATIVITY



SIR KEN ROBINSON
TEACHER, WRITER AND ADVISER TO
GOVERNMENTS ON EDUCATION

Why our education systems are stuck in the Industrial Revolution, how to be a lifelong student, and why it's vital that we learn how to view education through an organic lens.

Education is mankind's most significant investment in its future. However, the current school systems in most developed nations are built around an old economic and social model that predates today's massive technological and societal changes. They were created in the context of the Industrial Revolution and are now hopelessly out of date.

Firstly, given the scale and the rate of change in the size of our populations and the consequent strains we are putting on the planet, the future doesn't lie in increased competition for resources but in collaboration between nations and individuals. Our educational structures have yet to reflect this fundamental requirement that we all learn to work together to collaborate rather than compete.

Creativity is common, but often also latent. People are born with immense natural talents but you have to discover them and then cultivate them.

Secondly, our children are being subjected to an increasing process of standardisation and testing. The result is narrowing the curriculum and it hasn't worked. We have made education, for a lot of people, a stressful and exhausting process.

What we should be doing above all is cultivating the great diversity of people's talents, especially investing more

and more in developing innovation, creativity and collaboration. Creativity is common, but often also latent. People are born with immense natural talents but you have to discover them and then cultivate them.

One example is that most children, by the time they're eighteen months old, are speaking fairly competently. It's interesting how nobody teaches them how to do it. You don't take your child out at eighteen months and say, "We have to talk." We are deeply curious creatures and we have a fantastic appetite for knowledge. We like to learn.

The problems tend to occur, curiously, when we try to educate children. They go off learning when we try to school them. Not always, but often. By the time they get to be about eight, nine, or ten and they get to high school, learning may have become a bit of a drag.

There is a wonderful example in Venezuela of a national music programme called El Sistema. The program takes kids from slums, supplies them with instruments and puts on music classes. They have produced a whole generation of classical musicians including the star Gustavo Dudamel, who is now the conductor of the Los Angeles Philharmonic and one of the world's most distinguished musicians.

Time and again, if people are given the opportunity, they discover that they are capable of all kinds of things they hadn't considered. When you make education impersonal and focus on a certain type of academic work, it becomes very linear and limits rather than expands the horizons of those who are subjected to it.

These ideas don't only apply to children and teenagers. They also apply to people in their 40s, 50s, 60s and beyond. The current attitude to teaching is based on the idea that you get educated once in your life, but there have always been small programs of adult education.



One of the great pioneers of that model was the Open University in the UK, which represents a radically important shift in the way we think about education. It started in the 1970s and made university-level education available to anybody, at any age, irrespective of their background and qualifications.

I once had the great privilege of receiving an honorary degree from the Open University, and I gave the commencement address. It is a wonderful thing to watch people of all ages, even in their 90s, sit at the front in gowns, while their children and grandchildren cheered them on in the back. It is absolutely the case that we are all capable of carrying on learning, growing and developing our whole lives. As we live longer, returning to learning during our lives will become even more important.

It's why the shift from the old industrial model to a more organic model is important, because in the industrial model you make something once and off it goes. You may have to do a bit of maintenance on it from time to time but it's not expected to last forever.

But we need to see education through an organic lens. Farmers know that you have to keep planting every year – you keep growing and developing, and natural systems go through cycles which keep refreshing, and they carry on indefinitely if you create the right conditions for them. One of the big shifts we have to see is that education is not just about young people; it's a lifetime opportunity.

We also need to encourage students to find their passion. Some time ago I met an inspirational individual in Oklahoma named Bart Connor. When Bart was about seven, he discovered that he could walk on his hands as easily as he could walk on his feet. Nobody thought much about it except his mother, who took Bart to the local gymnastics centre. For Bart the gym was like Santa's Grotto and Disneyland all in one.

Ten years later, he walked on to the mat at the Montreal Olympics representing the US gymnastics squad. He went on to become the most decorated male gymnast in American history. He is married to Nadia Comaneci, who was the first female gymnast to get a perfect ten from Romania. Together they have a gymnastics centre, a TV program and they also work as ambassadors for the Special Olympics movement. Between them they helped to liberate the gymnastic capabilities of hundreds of athletes with special needs.

So, how do you facilitate creativity in education? I believe there are four key elements: the curriculum, teaching techniques, assessment, and the physical environment.

Firstly, the curriculum must be broad and dynamic. Most current curricula are narrow, and focused on particular subjects like maths and science. I am not saying that those subjects are not creative; they absolutely are. But the problem is the humanities, the arts and physical disciplines are pushed further and further down the priority list. But music, art, dance and theatre are every bit as rigorous in their own way.

Secondly, we must rethink most teaching methods. The job of a teacher is to help children to learn. Having them sit in front of you at desks and talk at them for an hour is one of the worst techniques, because it turns people off. Kids learn a lot from each other as well as from the teacher. So active group work is a big part of having a creative curriculum. When learning becomes a process of inquiry, you kindle the appetite for it.

Thirdly, our current standardised approach to assessment has to change to recognise that in many creative processes there isn't one answer. There may be many answers. You can look at a child's artwork, or musical composition, and criticise the composition, but it wouldn't make sense to look at a child's poem and say "that's wrong." One of the ways of encouraging creativity is moving away from the idea that there is only one answer.

Lastly, physical environment is really significant. A lot of what goes on in school is not required by law, it is just a function of habit, because we have just always done it that way. So we need to be flexible with physical spaces and school timetables, structuring our learning environments around students' needs, rather than conforming to tradition for the sake of it.

Children – and adults – have tremendously sharp minds and the appetite and ability to absorb vast amounts. We need education systems that help them to fulfil themselves, and systems that accept that there is no one good way to write a song; there is no one way to write a novel; and that there is no one way to run a school. Only then will we move from being constrained by conformity to being cured by creativity.

Sir Ken Robinson is an internationally recognised leader in the development of creativity, innovation and skills in education and business. The videos of his talks at the prestigious TED conference on how creativity can revolutionise schools have been viewed over 25 million times. He has been listed as "one of the world's elite thinkers on creativity and innovation" by Fast Company magazine. His latest book is titled 'Creative Schools: Revolutionising Education from the Ground Up'.

Q & A

LEARNING TO ZIG WHEN OTHERS ZAG



BRENT HOBERMAN CBE
ENTREPRENEUR, FOUNDER OF
LASTMINUTE.COM AND FOUNDERS FORUM

What makes an entrepreneur tick, why innovators have an urge to challenge authority and how the playing field for entrepreneurs is changing.

Q: What do you think makes entrepreneurs different?

Firstly, on the whole they have a chip on their shoulder and something to prove. Secondly they try, to quote Steve Jobs, to “think different” to think laterally. They all display tenacity: how do you break through the walls and not take no for an answer? Another characteristic is salesmanship – the great entrepreneurs create the aura that the future is here today and they’re building it. Lastly, I think entrepreneurs are on a mission to create something, and carry others along with them.

Q: What was it that made you an entrepreneur?

What made me different was being an immigrant. I think immigrants tend to be entrepreneurs. I’m a Jewish South African, so coming to England aged ten I didn’t quite fit in. I wanted to work harder and became very competitive. I was influenced by my grandfather. We were all in awe of a man who turned one clothes shop in South Africa into 650. But it wasn’t to do with the money. I saw he did what he loved every day, how excited he was to go to work, and I wanted to replicate that.

Q: So when did you become an entrepreneur?

At Eton College in the UK I did some slightly maverick things, like run a pirate radio station, but I think it was really at Oxford University where I did the things that people don’t think of as entrepreneurial but with hindsight they really were. Martha Lane Fox (Co-Founder of lastminute.com) still teases me about this, but the highlight of my C.V. really was running the University

French Club. I took it over when it had 53 members and when I left it had 500 paid members, with L’Oréal as sponsors. On leaving university I went to work at Mars & Co – the strategy consulting firm – and I was fired for being an entrepreneur. I had an idea, not a particularly good idea, to put a magazine in the back of taxi cabs; it would have been one of the top 10 circulation magazines in the UK. I told my boss I had a meeting at 8am at the Carriage Office who regulated it, and he set up a client meeting at the same time, deliberately. I said, “I’m sorry, I’m going to my other meeting.” They fired me a few weeks later.

Q: How did you come to found lastminute.com?

I met Martha and had the idea for lastminute.com, but I realised that I didn’t have enough experience, so I went to work for some internet companies first, and then we founded our own business after that. It’s preparation and timing that creates luck. I loved the internet, but I was also at the right point in my career, and at the right point in the cycle to take advantage of it. Then once we were in lastminute.com it was all about creating ideas. We had about ten business lines in 14 countries which was sort of insane and countered everything you read in the textbooks, but it worked for us. We were a founder-driven enterprise and I think we thrived because we were prepared to zig when others wanted to zag.

Q: More recently you’ve been an investor as much as an entrepreneur. What are you looking for when you think about investing in a business?

One of my rivals says that in a meeting with an entrepreneur he will try and distract them. He’ll say, “So tell me about your family, tell me about your kids.” Or “What do you like doing on a weekend?” and if they start going off on a tangent, then he writes them off as not passionate enough. For me, I ask myself, “Would my 25-year old self work for this person?” Then next I ask, “Do I understand it?” And finally, “Can I help?”

Q: Do certain countries produce more entrepreneurs than others? And if so, why?

Yossi Vardi, the great Israeli entrepreneur, has a great line on this which my mother would not enjoy reading. He said that Israel has so many brilliant entrepreneurs because “Jewish mothers, they make their children feel so insecure.” Israel is the start-up nation, not just because of the insecurity of course, but because there is a non-hierarchical culture. Everyone questions everything. Then of course there is America and Britain – although we are awkwardly placed in Britain because we’re big enough to build a decent business but not big enough to build a global rock star business. More recently in China there is a counter trend where you’re starting to see a new wave of actual innovators, not just copycats in the digital world.

Israel is the start-up nation... because there is a non-hierarchical culture. Everyone questions everything.

Q: Do all innovators want to challenge authority?

There are several studies looking at whether former prisoners make the best entrepreneurs. But I don’t think that a problem with authority is the only, or even the most significant, factor in what makes a successful business innovator. In some societies we can see innovation stemming from necessity, a kind of



frugal innovation. For me though, the most important factor is lateral thinking, and then the confidence to act on it. This is a problem for Britons, because we will join the queue, whereas the Israelis will jump it.

Q: Do you think an entrepreneurial society is a better society?

There are a number of factors at play here. If you define ‘better’ as a society in which there is more job satisfaction, where people enjoy their work more, then the answer is yes. If you define it as somewhere with more job security, then probably not. I’m not one of those who thinks, “Rah-rah, everyone should be an entrepreneur.” Secondly, are you creating a more equal and fairer society? Well, it will be more meritocratic, with more social mobility, but it will also be more ‘winner takes all,’ and some entrepreneurs do achieve very substantial rewards. It’s not just about a few gifted individuals getting rich. On the other side of the equation, there are businesses like Airbnb that are giving ordinary people a unique opportunity to sweat their assets. Overall, I’d say that societies with a strong tradition of entrepreneurial activity benefit hugely from that strand of their national life.

Q: Has what it takes to be an entrepreneur changed?

You need to be much more sophisticated now to find gaps in the market. A transport app would struggle against Uber, a generic e-commerce concept wouldn’t stand much of a chance against Amazon. Today you’ve got to understand new technology before everyone else, how you apply artificial intelligence for example. One change however is for the worse. It takes longer to fail than it used to, because

Societies with a strong tradition of entrepreneurial activity benefit hugely from that strand of their national life.

there is more money around. That’s not a good thing; if it’s not working after five years, then try something new, or at least that’s my advice.

Q: Why have you devoted so much of your life to promoting entrepreneurs?

I love spending time with other entrepreneurs. Naturally I think they are some of the most interesting people around, and being with people who have all these great ideas helps me to stay relevant and interested. Also, I was successful when I was quite young, so I want others to have the opportunities I’ve had. Entrepreneurialism in Britain is so much more accepted now, but I really enjoy the opportunity to unleash others who may not have had the lucky twists of fate that I enjoyed. The Founders of the Future initiative is all about that.

Brent Hoberman CBE is a British entrepreneur, who founded Lastminute.com in 1998. Brent co-founded Founders Forum, a private network for digital and technology entrepreneurs, and is a Governor of the University of the Arts, London.

CASE STUDY: KANO COMPUTING

CODING IS THE NEW CUNEIFORM



ALEX KLEIN
CO-FOUNDER AND CEO OF KANO COMPUTING

Why we created a 'Gutenberg Bible' for computing, how to teach children coding through DIY computing kits, and a new take on skills in the Indigo Era - discovery through doing.

Four years ago, I gave up a job in journalism, encountered a cheap Linux-based brain – the microprocessor central to every computer – in a Cambridge lab, saw that hackers were using it to make robots and submarines, and showed it to my little cousin, Micah, aged six. He didn't get it. What was the point? His challenge was simpler. "I'd like to make my own computer with this. But it should be as simple and fun as Lego. So no one has to teach me." We started working on a simple computer kit and Kano's mission was born.

From my little cousin's challenge, the idea for a kind of 'Gutenberg Bible' computing emerged – a learn-and-make system that would let anyone, anywhere, craft devices and play with code.

With friends, I travelled around the world, carrying 20 hand-folded boxes of bits, boards, and books (co-written with Micah). We workshoped with people of all ages in dozens of countries. Physical building – making a computer, syncing a speaker, setting up a screen – provided a tangible start. Our shell command and coding challenges combined traditional text with drag-and-drop blocks – strong storytelling framed level-up moments. A game mechanic, in which mastered syntax unlocks new powers, caught on. And most dramatic of all, a social network, built atop our computer kit (Kano World) played host to shared artworks, Minecraft worlds, songs, apps, and games. We added a self-guided tutorial. Like a share? Click on it, and it gets automatically converted into steps, for you to follow. "Kids GitHub."

Physical computing plays a big role in building interest: free cheap chips embedded in everything, connected everywhere, enable wizardry and camera filters that respond to movement, musical instruments that turn temperature into tones, ambient sport scores, physical interfaces. Barack Obama echoed the sentiment that, "Coding is the new literacy," encouraging kids to program their phones, and not just play on them. Like the old cuneiform tablets, rabbinical books, or Latin geometries,



programming is today a protected priesthood. Kano's mission is to show that inventing is for everyone and that creativity is a learned skill. Kano hopes to inspire the next generation of makers to take control of their digital future.

Utility is as important as innovation. In classrooms around the world, the Kano Computer Kit serves not only as a creative coding device, but as a proper open-source PC, a platform to explore the inner workings of a file system, go on a narrative Terminal Quest, or just do homework, watch videos, and browse the web. Other users take their adventures with Kano one step further, like the Tennessee classroom that turned Kano into a weather station, the Oklahoma kid who created a flower-capturing time-lapse camera, the Sierra Leonean teen, proud inventor of a radio station, and the New York musician who used Kano to code a beatbox visualiser. Kano will be the first DIY, open-source PC to reach the shelves of Toys 'R' Us and Barnes & Noble this Christmas, putting learning through play into the hands of the everyday consumer.

Leaps and bounds in technological advancements mean a whole new skillset for the next generation beckoned

Giving the next generation access to computer science education is no longer a luxury – it is fast becoming a human right.

in by the Indigo Era. As Careerfoundry put it, "Unless workers start training today, this tech skills gap will only widen." Rather than tablets, we're after what Seymour Papert once described as a "learning machine." To quote Dr Papert, "A child who has grown up with the freedom to explore, provided by such machines, will not sit quietly through the standard curriculum dished out in most schools today. Already, children are made increasingly restive." The sudden convulsion to bring coding classes (or coding apps, paradoxically, on un-codeable iPads) to every school speaks, like it did for the ancients, to a shared sense of lack of control – a world that we seem to feel needs more imitation and order.

We should feed the restiveness, not the fear. Self-directed education is



becoming the norm – not instruction, nor imitation, nor pre-job preparation but rather, discovery through doing.

The common refrain is that this generation is narcissistic concerned only with their image, their number of likes. The truth is, with a canny sense for cut-through-the-noise expression, they are sidestepping validation through career paths. A hyper-sensitivity to the needs of the network – when coupled with a real understanding of how that network, and the algorithms and devices that present it work – can give us new kinds of geniuses. Like Battushig Myanganbayar, a Mongolian teen, driven to get a YouTube MIT degree not by a ‘tiger mother’ or a lucrative Facebook gig, but, in his words, “I want to make good things for humans.” Myanganbayar is proof that technology is an empowering force for good for many young people around the world. Giving the next generation access to computer science education is no longer a luxury – it is fast becoming a human right.

According to UNESCO, due to population growth and mandatory schooling, in the next three decades, more people will receive formal education than in all of human history thus far. But it may be the rise of

From my little cousin’s challenge, the idea for a kind of ‘Gutenberg Bible’ computing emerged – a learn-and-make system that would let anyone, anywhere, craft devices and play with code.

informal, self-directed education that finally wrests us out of Tablet School. Beyond disciplines in search of disciples, we can at last have individuals who grow quickly out of imitation, and start reframing and rewriting the old categories – driving not only a new kind of computing, but a new culture too.

Alex Klein is the Co-Founder of Kano, a DIY computer kit designed to teach children how to code and build computers. Kano is one of the top crowdfunded learning inventions, and has been backed by Apple Co-Founder Steve Wozniak and Kickstarter Founder Yancey Strickler.

CASE STUDY: LIBRARY FOR ALL

FIGHTING INEQUALITY IN THE LIBRARY



TANYELLA EVANS
CO-FOUNDER AND CEO OF LIBRARY FOR ALL

Library For All is a nonprofit organisation that provides educational materials and books to millions of students in the developing world via a digital library.

We should feed the restiveness, not the fear... Nor imitation, nor pre-job preparation – but rather, discovery through doing.



Globally, 250 million children are not learning to read and write, risking the loss of an entire generation's participation in our fast evolving society. A lack of access to good learning materials is a major barrier to literacy. But merely shipping textbooks in bulk to the developing world is expensive and inefficient, and cannot by itself solve the problem.

Library For All is a nonprofit organisation that has built a customisable, digital library to deliver culturally-relevant books and educational materials to developing countries. Our mission is to give equal access to knowledge. In areas where books are scarce but mobile phone networks are growing, our cloud-based library operates on devices that already exist in developing countries.

Some argue that libraries will become outdated once everyone has access to the internet. But information from the internet is different from knowledge gained from books, and the production of knowledge is mainly focused in the West. To address this, we wanted to

create a digital library platform to democratise knowledge and reduce deprivation: if all students in low income countries had basic reading skills upon finishing primary school, 171 million people worldwide could be lifted out of poverty.

Access to knowledge is a critical factor in supporting economic development and boosting the 'Indigo Economies' of the future.

The great libraries that have shaped our societies – the Bodleian in Oxford, the Library of Congress in Washington, and the Ancient Library of Alexandria – were confined to printed pages, in august architecture firmly rooted to the ground. But with today's technology, we can build virtual libraries across the developing world that transcend physical boundaries.

It is vital that developing countries strengthen the social fabric by making society more free and open. The work of building a national digital library must be part of this enterprise. I would agree with John Palfrey, author of *Bibliotech*,

that libraries are the core democratic institutions that are the "lifblood of an informed and engaged Republic."

Access to knowledge is a critical factor in supporting economic development and boosting the 'Indigo Economies' of the future.

In Rwanda, we partner with major telecommunications companies to zero-rate our platform, removing the cost of data as a barrier to accessing knowledge. This provides our users with access to hundreds of high quality books at no cost, with many coming from local authors. We also work directly with the First Lady of Rwanda's Foundation to improve access to ICT and create a love of reading, especially amongst children.

Strengthening the social fabric may take a long time, but technology can

speed up the process. Since 2000, the number of mobile phone subscriptions in developing countries has jumped from one billion to six billion. The accelerating network effect of mobile technology is having huge social, political and economic consequences, from Silicon Valley tech giants to the Arab Spring. In the field of education, technology is reshaping the traditional teacher-student relationship by using data to power a two-way conversation. For example, users of our digital library platform are able to submit feedback and request different kinds of books. Usage statistics help us to shape the strategy of content curation to meet users' demand. As a result of the seismic shifts in connectivity and access to knowledge, we may see an acceleration in the emergence of the cultural ecosystem necessary for the Indigo Economy in developing countries.

LOCAL LIBRARIES FOR LOCAL LITERATURE

You might expect that the most popular titles in our digital library would be Western books, as they tend to be the higher quality, more brightly illustrated titles. However, our data show that the books with local content and language are most popular amongst our readers. It is often taken for granted that globalisation means less local cultures in place of one homogenised culture, but our readers' preferences show clearly that global development and the preservation of native narratives can go hand in hand. In her TED talk the great Nigerian author, Chimamanda Andichie, speaks about the "danger of a single story." Growing up in Nigeria, she explains that all of the children in the stories she read as a child featured characters that were totally foreign. Her discovery of the rich African literature much later was key to uncovering her own unique voice. As she describes, "I went through a mental shift in my perception of literature. I realised that people like me, girls with skin the colour of chocolate, whose kinky hair could not form ponytails, could also exist in literature."

Students across our programs regularly experience this kind of cultural



awakening. In Cambodia we heard the following story of a 13-year-old girl of using our digital library: the student's father is a tuk-tuk driver and her mother helps her mom sell clothes. She has always liked to read, especially folk tales, but she reads a lot more now that she has access to the books in the Library For All app. She likes the clarity and brightness of the reading experience, and finds it easier to navigate compared to books in a school library. Her favourite books in the digital library are the storybooks based on Khmer legends, the local stories of Cambodia.

The Indigo Era presents a rather terrifying future of a world with widening inequality, increased propensity to international violence and isolationism on the part of the West. One of the last stalwarts against this outcome is the library, which will continue to help us develop the social infrastructure that allows every person to realise his or her intellectual and creative potential.

Tanyella Evans is Co-Founder and Chief Executive of Library for All, a non-profit organisation that provides educational materials and books to millions of students in the developing world via a digital library.

"My books are very few, but then the world is before me – a library open to all – from which poverty of purse cannot exclude me – in which the meanest and most paltry volume is sure to furnish something to amuse, if not to instruct and improve."

Joseph Howe
1824

FREEDOM AND THE GREAT ENRICHMENT

An Interview



PROFESSOR DEIRDRE McCLOSKEY
DISTINGUISHED PROFESSOR AT THE
UNIVERSITY OF ILLINOIS AT CHICAGO

How we can learn from the Great Enrichment of the past two centuries; why people, not institutions, are the key to the new era; and what makes liberated people ingenious.

Q: Your recent book, 'Bourgeois Equality: How Ideas, Not Capital or Institutions, Enriched the World', focuses on the role of ideas, in particular how we must focus on people, rather than technological innovations. Why do you place people at the centre of your argument?

I strongly emphasise technological innovations, which I call "trade-tested betterments." The contrast is with sheer accumulation, without betterment, brick on brick or "good institutions" without betterment, such as the English common law, institutions which did not change much and were often conservative rather than progressive. But, yes, people. It is people, after all, who devise the betterments out of their imaginations. After 1800 their imaginations were fired by liberalism, that is by a new, if rough, equality before the law, and a new, if rough, equality of dignity in society. To get a great mass of trade-tested betterments, and the consequent Great Enrichment, northwestern Europe in the 1600s and 1700s and later needed to develop a mass of liberated people, inspired to innovate as never before. So it did, with the payoff after 1800 anywhere from 3,000 to 10,000 per cent increase in real income per person.

Q: You have written about how people in the poorest parts of the world will, in time, be as rich as those in the richest part of the world. How will this happen? What are the forces that will drive it?

The forces that will drive the whole world to become rich are temperate self-interest and temperate governance. As the blessed Adam Smith put it in 1755, "Little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and a tolerable administration of justice; all the rest being brought about by the natural course of things. All governments which thwart this natural course, which force things into another channel, or which endeavour to arrest the progress of society at a particular point, are unnatural, and to support themselves are obliged to be oppressive and tyrannical." Surely there can be no racial reason – as we have come to understand after the fall of eugenics – to go on supposing that sub-Saharan Africa or Latin America or the Middle East must forever be poorer than Europe or the Anglosphere.

Q: How will the 'Great Enrichment' idea that has enriched our lives since the 1800s apply to the next two centuries?

In the next two centuries, or the next fifty years, we will see South America, Africa, and the rest join in the Bourgeois Deal. I argue in my books that the new ideological deal was, "Let me earn profits from a trade-tested betterment, and I will make you rich." The enrichment will cause, and be caused by, a cultural explosion, casting fifth-century Athens and the Renaissance into the shade.

In the next two centuries, or the next fifty years, we will see South America, Africa, and the rest join in the Bourgeois Deal.

Q: Do you think change in the world is accelerating? If so, do you believe that humanity will benefit from this increased pace of change, and why?

Yes, growth is definitely accelerating. Take real, inflation-corrected GDP per person, a pretty good measure of the goods and services available to the people. It has leapt up in the past few decades, and (with bumps from recessions) is growing at the fastest pace in world history. Having a decent little house and enough food and reasonable education for one's children is a gigantic improvement over the miseries of 1800, or of 1900, or even of 1960. I readily admit that GDP isn't everything. But to sneer at it, and to constrain growth carelessly in aid of redistribution or environmentalism, is to condemn the wretched of the earth to perpetual wretchedness. The constraining satisfies the egos of a proud clerisy of theorists advising governments, but it is bad policy, and unethical. The wretched urgently need 30 times higher real GDP per capita, which is what the Great Enrichment gave the wretched of the now rich places.

Q: Technology appears to be concentrating wealth, or at least entrepreneurial wealth, in the hands of fewer rather than more individuals. How will your Great Enrichment survive this trend?

Concentration of wealth isn't a trend, not in a way that matters. Wealth is paper stocks and bonds, or the physical capital behind them. But its distribution, which even on the narrow measure was less equal in 1900 than it is now, and much less equal in 1800, is not the relevant story. Human capital has become in the past 150 years a much more important share of earnings each year, returns which are always a return on the total of physical and human capital... and out of the income the world consumes. Consumption is much more equally distributed than the income, not to speak of the wealth. You can't put on more than one pair of pants at a time, which in that respect makes you equal to your poorest neighbour. That you have sixty pairs in your closet is nice for you, but not a gigantic improvement over having three pairs, washable with newly invented detergents in newly invented washing machines for hire in the newly invented institution of free-enterprise laundromats. And what one might call basic consumption out of the total consumption – the modest housing, food, and education for a dignified human life – is much more equally distributed even in now-rich countries than it was in 1960, not to speak of in 1800. That is, the important equality has increased, not declined, even recently.

In 1960 it was much more sensible and ethical to worry about the 4 out of 5 billion on the planet that were at the miserable bottom, than about how many yachts or jewelled watches Liliane Bettencourt had. By now the miserable bottom has fallen to 1 billion out of today's 7 billion. The world is much more equal than it was, if measured in ethically relevant terms: basic consumption, rather than the irritating excesses of the top 1 per cent. The share of the world's people living in the utter misery of \$1 or \$2 a day, for example, has been halved in the past few decades.

To go on chattering about concentrated financial wealth when it's not happening much, when it is caused, when it does happen, by housing policy more than inheritance, when it reverses because of entrepreneurial entry (Uber, for example), and when it is not the sort of inequality that actually matters (namely, basic consumption for a dignified life), is to stir up an insatiable envy and anger. The stirring up has had political results which we see now worldwide.

Q: The cultural factors which you argue are at the heart of the Great Enrichment would appear to benefit a limited number of countries at the expense of others. They have greater freedoms and better education. How will the developing world, with less freedom, poor governance and limited education, compete?

The crux in dealing with poverty is not exactly, "cultural factors" which most economists believe, erroneously, to be given and fixed. Rhetoric, ideology, policies can change, and quickly. They did in China in 1978 and India in 1991. If badly governed, the developing world will not do well. If well governed by the modest standards articulated by Smith, it will grow rapidly, and get the education it needs. The cry for more education, by the way, is often a despairing excuse for not liberalising the economy directly and quickly. I have seen it in South Africa. Black people do poorly, because they are excluded from employment by the labour laws installed in 1994. The political left calls not for relaxation of the crippling labour laws, but for more education, to make the poor worth hiring at the high minimum wage. The policy is cruelly back to front. If people had jobs they would see to the education of their children soon enough. Meanwhile they could sell food on the street or get basic consumption with a steady job in a factory. They do so in Singapore and Botswana and South Korea. They can in South Africa, if the left will only relent. The worst form of government is to cripple the economy for nationalism or socialism or, if you like both of these two, their combination in national socialism. Inability to compete, though, is not the right word to describe the problem. Trade is not a football game. The world is not zero sum. France's prosperity does not damage Chad's. The right word is 'poverty'. China and India grow at over

7 per cent per year per capita. Brazil and South Africa are lucky to achieve 2 per cent. Why? Good, quasi-liberal, ideas-and-entrepreneurship theories of economic policy on the one hand and bad, illiberal, capital-accumulation-and-dependency theories on the other. The lagging countries can change – after all, China and India, frozen for decades in central planning socialism, did so. Let us pray for liberalism.

Q: What are the most important factors that we need to consider for the economies of cities and countries to be strong, robust and adaptable over the next century?

As the theorist of vibrant cities, Jane Jacobs said in all her work, what we do not need is arrogant architects such as Le Corbusier or highhanded city planners such as Robert Moses wrecking our cities. “Germane correction,” she wrote in 1984, “Depends on fostering creativity in whatever forms it happens to appear in a given city at a given time. It is impossible to know in advance.”

Q: You have also emphasised the importance of equality – in the sense that when people had equality before the law and equality of social dignity, it, “made people bold to pursue betterments on their own account.” Do you see a parallel in the twenty-first century with the rise in flexible working, self-employment and entrepreneurs wanting to make their own decisions?

Self-employment often arises from restrictions on the terms on which people can be employed. Uber taxis are a good example, eroding the absurd monopoly of taxis city-by-city worldwide. I would rather reduce the corrupt regulations that create the incentive to self-employ in the first place. But given excessive custodianship, the self-employment – in the black economy, for example – is the only way out. Mohamed Bouazizi again.

Q: You have suggested a move towards “humanomics”. Could you expand on what “humanomics” might entail?

The economy works to a surprising degree with words – not commands, but changes of mind, persuasion, “sweet talk”. As the making of things and the delivery of services becomes, thankfully, more and more cheaply automated, humans will more and more be left in the business of sweet talk, deciding what to do and how. Sweet talk is already a quarter of income in rich countries, and rising. “The study of words and meaning” merely makes us wiser about persuasion. We’d better be, or we fall for the Donald Trumps of the world.

Q: Where do you think the centres of the Great Enrichment of the next 200 years will be, and why?

Sub-Saharan Africa will become the artistic and intellectual centre of the world. It has the largest genetic variation, on account of what geneticists call “the founder

effect” which applies to the expansion of any species of plant or animal. When the descendants of all other *Homo sapiens* left Africa in dribs and drabs after about 70,000 BC many of their genetic lines died out on the trip. Unusual human abilities, to the extent they are genetic, are therefore much more common in the old heartland of Africa than in the new settlements in Eurasia. Unusual African abilities are already evident in sports. The East Africans dominate long distance running and the descendants of West Africans dominate sprinting. There is no reason to doubt that unusual artistic and intellectual abilities, too, lie untapped in the great genetic variability south of the Sahara. Consequently, in fifty years or so, when Africa is as well off as Europe, it will nurture the best musicians, artists, mathematicians, scholars, and chefs. The leading studios and universities and editorial offices in 2100 will be populated by Africans.

Q: What advice would you give to someone at school today about how they should set about shaping their future?

Learn how to think. Stop reading The New York Times, get off the internet, and start reading serious books. Read on the assumption that half of what most people believe is nonsense. It is. Learn one subject, such as economics or literature or mathematics or philosophy, deeply and critically, in order to understand what “depth” and “criticism” really is. But then read widely, if necessarily somewhat superficially, in for example the best of popularisations, such as by Matt Ridley or A. N. Wilson or John Horgan. Read the best novels – never the current best sellers, which are often rubbish – but the old ones that have survived the test of time, such as Willa Cather or Jane Austen or Leo Tolstoy. Read history at the highest academic level you can stand. Read, read, read, and learn thereby to think for yourself. Don’t become a follower of any party line, as tempting as they are.

Q: You say you are an optimist. Is this, do you believe, an intellectual position or an attitude of mind?

It’s mostly an attitude of mind – one does not change gender, as I did in 1995, unless one is optimistic! But that it is a ‘mere’ attitude does not make it mistaken as an intellectual position, too. As the great and optimistic historian and essayist T. B. Macaulay wrote in 1830, “On what principle is it that, when we see nothing but improvement behind us, we are to expect nothing but deterioration before us?” On what principle, indeed, except an ever-fashionable pessimism, which over and over since 1800 has proven to be mistaken?

Deirdre McCloskey is the Distinguished Professor of Economics, History, English and Communication at the University of Illinois at Chicago. She has received six honorary doctorates since 2007, and had been awarded the Julian L. Simon Memorial Award for her research into the advancement of human achievement. She was talking to Edward Amory.



THE ROOTS OF KNOWLEDGE



YURI MILNER

ENTREPRENEUR, VENTURE CAPITALIST
AND EARLY INVESTOR IN FACEBOOK

The Tree of Knowledge for the twenty-first century, why enlightenment needs deep roots in the social soil, and whether civilisation faces a race against time

The foundational story of Western culture is a story about knowledge. Already at the dawn of civilisation, long before we came to call ourselves *Homo sapiens*, we understood that this was the essence of being human. The children of Adam and Eve are defined by what we know.

Yet it is only in the last few centuries that we have begun to reap the rewards of that knowledge: eradicating many sources of human misery, exerting control over earth's environment, eventually even reaching beyond it. The reason is that it took us until the seventeenth century to invent the scientific method. Before that, we were the same species, with the same brains and the same gift for learning. But we lacked the spark that turns knowledge into a self-feeding flame.

When war, or revolution, or some other upheaval came, the nascent scientific culture was abandoned. The same thing could happen again.

We are now entering a new chapter in the story, with the transition to what Mikhail Fridman has called the, 'Indigo economy' – an economy dominated by knowledge, ideas and creativity. The success or failure of this transition depends on the structure and values of global society. Knowledge creation also

depends on the continuing progress of fundamental science.

When you use your mobile phone to find a street, you are leveraging the deepest theories in physics: general relativity (for GPS) and quantum mechanics (for functioning microchips). Modern medicine is increasingly driven by basic research in genetics, cell biology and neuroscience. And virtually every technology relies on mathematics that was originally worked out for the sheer joy of it. The greatest advances of the next generations will surely stem from curiosity-driven breakthroughs in fundamental science. (Good bets might include quantum computers, gene editing and AI.)

In a feedback loop of exponential power, these new technologies will drive further scientific advances – just as Maxwell's discovery of radio waves enabled radio astronomy, which brought us news of the Big Bang; just as the internet, invented at CERN, is transforming every science. And the sciences, thus transformed, will once again transform technology.

Or will they? Can we be sure that knowledge will keep growing, that the feedback loop will not be broken?

In Genesis, knowledge is represented as a tree. It's an apt image. Like a tree, knowledge is self-creating, endlessly branching, fertile – and fragile.

This fragility is not immediately obvious. All around us we see the fruits of science and technology. We talk about progress as if it were a force of nature, which, once unleashed, is unstoppable.

But it is not a force of nature. It is a human practice, embedded in culture. And it is far from unstoppable.

To see this, we must ask why it took so long to reach the Enlightenment and invent science. The answer is that it didn't. Between Eve's apple and Newton's, there were several enlightenments. The ancient Babylonians and Greeks, the mediaeval Chinese, Persians, Arabs

and Florentines – each flirted with a scientific revolution. Important truths in astronomy, biology and mathematics were discovered. But they never led to exponential knowledge creation.

Why? Because the tree of knowledge was not deeply rooted in the social soil. In each case, when war, or revolution, or some other upheaval came, the nascent scientific culture was abandoned.

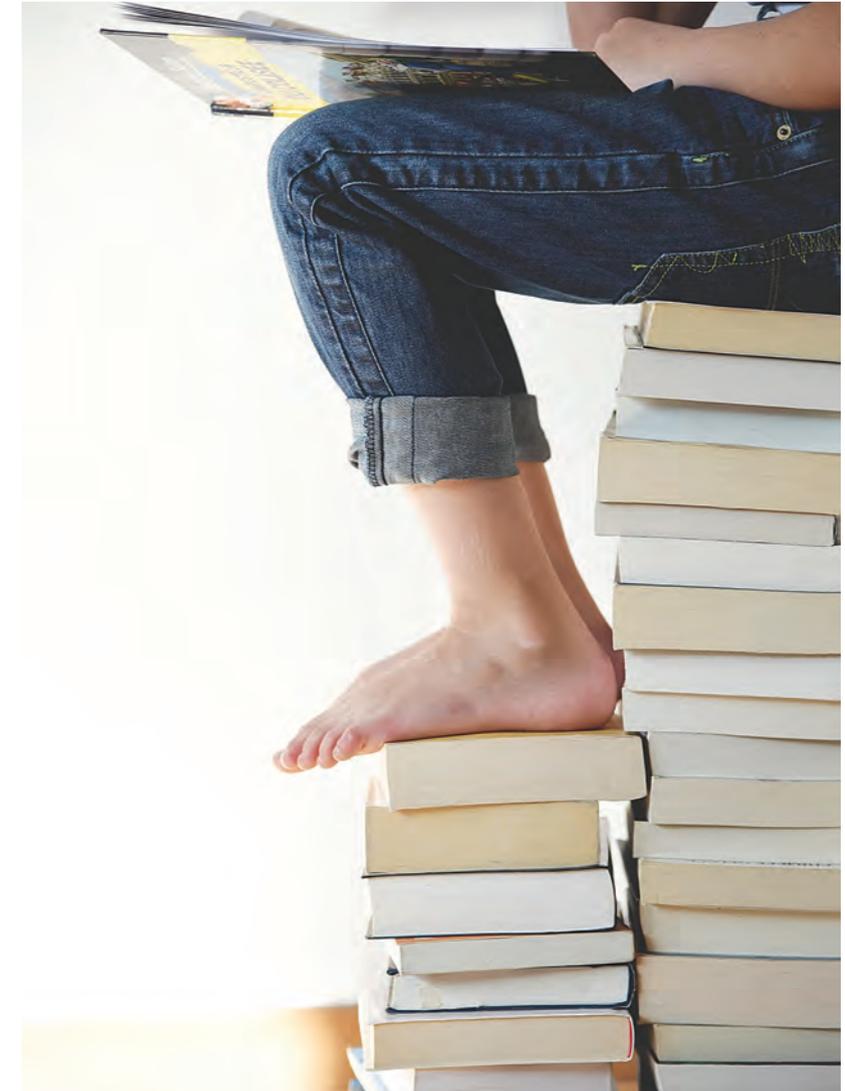
The same thing could happen again. Although the roots of science have grown strong over the last 400 years, their soil remains thin. Despite all our progress, the pure pursuit of knowledge is not very highly valued in today's society.

These decisions reflect the priorities of a public that is thrilled by technology, but lukewarm about the science that feeds it. But like the Indigo economy, the scientific enterprise can only flourish if it is embedded in a certain kind of global culture – a knowledge culture, in which the majority of us who are not scientists nevertheless embrace certain scientific values: we are rational and critical in our thinking; planetary and universal in our perspective; and fully invested in the quest for knowledge for its own sake.

Only a society committed to this ethos can face down the various forms of fundamentalism that accept technology but reject the scientific worldview. In living memory, we have seen such a movement take over Germany – at the time the world's scientific powerhouse. It could happen again. Meanwhile, external hazards that threaten our entire civilisation – such as asteroid collisions – require scientific progress if we are to avoid them. The need for a knowledge culture is far from an academic concern. It is a race against time.

The fruits of the Indigo economy, and the scientific progress it is built on, hold the promise to transform our lives, and our planet, for the better. But we cannot afford to sit back and wait for it to happen. We have a duty to prepare the ground for knowledge and human creativity to grow.

The greatest advances of the next generations will surely stem from curiosity-driven breakthroughs in fundamental science.



Yuri Milner is a Russian entrepreneur, venture capitalist and physicist. He founded investment firm Digital Sky Technologies, through which he has invested in the likes of Facebook, Twitter, Spotify and Alibaba. Milner was listed as a 'Titan' by Time magazine in 2016.

Q & A

THE NEW GENERATION OF ENTREPRENEURS



NICK D'ALOISIO
COMPUTER PROGRAMMER,
INTERNET ENTREPRENEUR AND
THE INVENTOR OF SUMMLY

Automated access and autodidacts for millennials, why combining humans with computers will succeed as the hybrid model for innovation, and why artificial intelligence should help, not replace, the human brain.

Q: If you were an ambitious teenager, like your younger self wanting to participate in this brave new world, how would you do it?

I think the greatest opportunity is the amount of information that already exists on the internet. Self-learning was very important for me and is getting easier every year. It's quite surprising to think 20 or 30 years ago it was very difficult to acquire knowledge if you weren't lucky enough to go to a top university or a good school. Although the knowledge in today's world is still written in long-length form, whether it be in academic journals or snippets of code, access is gradually becoming more automated.

Q: You chose to study at Oxford University after becoming a successful entrepreneur – is that a contradiction?

I think it's very complementary. I decided to go to Oxford for two reasons: first to academically formalise my knowledge, because I might want to pursue an academic career in the future; and secondly I wanted the university experience. Although the need to go to university to get access to knowledge and information is less today than a few decades ago, I still think it has significant benefits when it comes to maturing and acquiring social experiences.

Q: In a world facing very substantial changes, is the rarefied academic experience that you've sought out at Oxford still useful?

Oxford gave me access to the academic rigour associated with academia, both in computer science

and philosophy. I wanted to set my real world experience within a formal theoretical framework, and in particular to study computer science from a theoretical standpoint, whereas the approach at Stanford and similar universities has more emphasis on their application in the real world.

I believe in the hybrid model – putting together humans and computers. Humans are very much equipped to solve certain kinds of problems so there will always be a role for them, and I reject automation for its own sake.

Q: When hiring people from this new generation, do you think businesses need to behave differently towards them?

Over the last 30 years there has been a rise in allowing employees to direct their own careers and organise their working day to a far greater extent. I look for potential employees who have developed self-discipline and self-motivation and learnt how to direct their own path in life and in education. The good news is that irrespective of whether they went to a top class university or not, a lot of people are learning new skills through using the internet – to do their own research for term papers, or coding projects, or

learning design on Tumblr, or whatever it might be.

Q: Do you think you have a different approach from the previous generation of tech entrepreneurs?

I don't think I had a different motivation, but I did have a different method. I was able to discover far more information than had been available in the past and so I was able to go about building a company where I could apply the idea, build a prototype and get that out to real users and get feedback before needing to conceptualise it or get funding. I can imagine that a generation ago, if you wanted to be an entrepreneur you would likely have to premeditate the usage of your product a lot more than you do today, and to justify it conceptually. In the case of Trimit which became Summly, I didn't go into building that product thinking I was going to create a company of any sort. It was far more that I had this idea for application technology, and I wanted to send it out to users to see what they thought.

Q: Do you see yourself as a serial entrepreneur – someone who is waiting for the right moment to start up your next business?

Entrepreneurship to me isn't the word. I see myself as a self-learner – someone who is constantly trying to learn about things, think about things in a new way, fuel my curiosity. I would like to build another technology company. I had a great experience with Summly, and I have a lot more ideas. But in the longer term I can see myself switching to other areas of interest.

Q: Automation has led to job destruction as well as creation. Do you think that's a problem?

In the short term, new technology may destroy jobs in older industries, but we can't predict what other opportunities it might lead to in the longer term, so the question is impossible to answer. What I learnt at Summly and subsequently building Yahoo News Digest was that I believe in the hybrid model – putting together humans and computers. Humans

are very much equipped to solve certain kinds of problems so there will always be a role for them, and I reject automation for its own sake.

Q: At Oxford you are reading Computer Science and Philosophy. Is that a deliberate combination?

In Computer Science you are studying a logical system, and Philosophy is the study of logic and reasoning, so there is significant formal overlap. Personally I am interested in the philosophy of mind and consciousness and this relates heavily to artificial intelligence. I think it is good for someone who wants to go into computer science, and build companies that leverage artificial intelligence, to have had that classical training in how to deal with those problems.

Q: Do you think artificial intelligence is the new frontier?

We are at a stage now where the best application of technology is to understand large amounts of data. I see artificial intelligence, the algorithms, most useful when assisting the human, not as a replacement but as complementary to the human. I think the technology today is at its most useful as an assistant, and what I think we mean by artificial intelligence now is the ability to learn from mistakes, not to replace the human brain.

Q: Last summer you served as Airbnb's Entrepreneur in Residence. What did that involve and what did you learn from it?

Brian Chesky (co-founder of Airbnb) was an investor in Summly. I got to know him over that period and he wanted me to come to California to work on a stealth project – which I can't really talk about much. The biggest lesson I took away from Airbnb is that they don't see their users as numbers, but as valuable human beings. I think we need a brutal honesty about the limitations as well as the benefits of technology. The most successful companies over the next decade will be those that are very honest with themselves about the limitations of their own technological solution.

I think we need a brutal honesty about the limitations as well as the benefits of technology.



Nick D'Aloisio is a computer programmer and internet entrepreneur, best known as the inventor of Summly, an automatic summarisation algorithm, which was acquired by Yahoo in 2013 for a reported \$30 million. Nick is the youngest person to receive a round of venture capital in technology, at just 15 years of age. He is studying Computer Science and Philosophy at the University of Oxford. He was talking to Edward Amory.

THE NEW HUMAN LIFESPAN



**PROFESSOR
LYNDA GRATTON**
PROFESSOR OF MANAGEMENT PRACTICE
AT THE LONDON BUSINESS SCHOOL

How living to 100 will lead to a fundamental reconstruction of life, battling rising inequality as people live longer, and retraining for second and third careers as people work into their 80s and 90s.

Our world is being remade, and at a speed unprecedented in history. Nowhere is this more apparent than in the way we work. Not only the jobs that we do, but the way in which we do them, will have been transformed within a single generation.

In a bid to understand these changes and their implications, seven years ago I founded the Future of Work Consortium involving about 50 corporations around the world. We meet frequently to discuss the set of forces that are reshaping the world of work, and how governments, companies and individuals should respond.

The first and most significant change is technology and the speed and ease of connectivity, which is having a profound impact on where and how people are working. There are positives, but also significant challenges. There have been predictions that as many as 40 per cent of current jobs will be lost, mainly in the middle skill portion of the jobs market.

Second, there are the significant demographic changes as people's lifetimes increase. People born today can expect to live for 100 years or more, which will lead to a fundamental reconstruction of life.

Third, and also important, are the changes in the ways that societies behave, in particular the breakdown of

trust between the majorities and the elites or expert classes.

Each of these has implications for who wins and who loses, and therefore ultimately for the stability of societies in general. Technology, for example, appears to be increasing inequality. As the World Bank data show, the winners have been the global rich and the middle classes in the emerging countries such as India and China, and the losers have been the global poor and the middle classes in developed countries in Europe and the US. Much of the data on what is called the 'hollowing out of work' show that the major loss will be in middle and low-level jobs while higher skilled jobs will survive.

This is significant because even if societies are rich enough to look after people who don't have jobs, most people don't want to be 'liberated' from the world of work – they enjoy their job and it helps give significance to their lives. So if they lose their jobs in the future because, for example, driverless cars have been developed, they will lead poorer lives as a result. The data on unemployment demonstrate that when you don't have a job, your skills, your social networks and your personal identity all atrophy.

As people live longer lives there is also an increasing risk of inequality. The rich not only live longer, because they can

afford better healthcare, but are able to save sufficient money to retire while still relatively healthy. Those people in the middle of the income scale, who might have been able to retire relatively comfortably a few years ago, can now expect to continue working for much longer. Right now, those on lower incomes live on average 12 years less than the rich – so they face the awful prospect of having to work longer and then having only a very limited period of retirement. This is a profound challenge that government policy will have to address over the coming decades.

People born today can expect to live for 100 years or more, which will lead to a fundamental reconstruction of life.

It is not all doom and gloom. Living for 100 years is a huge opportunity for mankind. But it would be a mistake not to acknowledge the potential dark side, and to recognise that corporations and governments are far from being prepared for the scale of the changes and the transformations they will face. Across the world there are some governments that are showing the way in different areas.

The Ministry of Manpower in Singapore is a good example; in fact, they funded my initial thinking on the future of work seven years ago. Over the years a very strong reciprocal relationship has been built between corporations, the government and education, and this multi-stakeholder group has been able to address some of these challenges – but of course it takes a very strong handed civil service and highly talented ministers to create this reciprocal relationship.

Another country that we could learn much from is Japan, which has an ageing population and has focused on both technology – for example with the development of robotics in



elderly care – and on fiscal policies, for example giving tax breaks to those families with four generations living in them. The flexible working practices in Scandinavian nations, such as Norway and Denmark, point the way to how working lives can become more adaptable.

No government, however, has entirely cracked how to respond to all these changes, in particular in the education sector. When people live longer lives, and at a time of profound technological change, then their skills become rapidly outdated. So the focus is on continuing to learn right through the lifecycle. At the moment neither government policy nor educational institutions are set up to deliver this.

There is also a challenge for companies. The way most firms think about talent is often incredibly traditional and old fashioned. Take, for example, the expectation that the most talented people will want to work for a company full time and on a salary. The reality is that increasing numbers want to build their own business or brand and then sell their IP rather than going through hours of work.

The reality is that increasing numbers want to build their own business or brand and then sell their IP rather than going through hours of work.

There will also be a struggle with day-to-day flexibility. Working from nine to six might be acceptable if you are going to stop working at 55 or 60, but what happens when you want to work into your 70s and are a member of a dual career partnership? There is no doubt that the level of relentlessness that creates is going to deplete your intangible assets over time – your productivity, your family life, your friendships and your health.

Organisations will have to be far more flexible.

It's not just work that is going to have to evolve to cope with our changing world. Our personal relationships will be impacted too. In our classes we ask our MBA students to describe the sort of relationships they see themselves having in the future. There is a great deal of diversity in their response. Some say that it's very important to them to find the right person and live together until they're a hundred years old, so they're going to go through a careful process of choice.

Humanity has a bright and interesting future, in which we will live longer and richer lives, aided by technology.

Others expect to have different kinds of partners at different stages in their life. There is no doubt that traditional relationship structures will change. Right now, young people are putting off getting married, and for those who are married, the highest divorce rate is among the over 60s. Without a doubt a more dynamic marketplace for marriage and jobs will emerge and the dividing line between work and home will become increasingly fluid.

All this has significant implications for the ways that companies are managed and led, and there are three areas in particular where firms need to behave differently.

Firstly, organisations and leaders must build a much stronger capability in foresight and the capacity to think about the long term. This has been crucial for corporations. For example, at Unilever it has resulted in CEO Paul Polman becoming very involved in climate change and a broader array of resource issues.

Next, it is clear that the world is going through an era of enormous

transformation to which businesses will have to adapt. I chaired the World Economic Forum Council on the Future of Leadership a couple of years ago. One of our major insights was that business leaders have a key role in building a narrative about the future that people find compelling and want to walk towards.

There is no doubt that in these times of flux that's a very difficult thing to do. Some leaders work by creating a narrative of fear that people want to run away from. This might work in the short term, but it's never the right way to prepare for the future. These narratives have to be future orientated, positive and honest.

Finally, getting ready for the future requires trust, which is in short supply globally at the moment. In the past, I believed that a breakdown in trust between businesses and society wasn't a fundamental problem, and could be fixed by greater transparency and honesty on the part of the corporations. More recently, I have become concerned that the global public has lost trust in experts and data of all kinds. I believe this is a shift in the wrong direction. It seems to me that in a functioning democracy the provision of truthful information by non-partisan experts is crucial to helping people make informed decisions. The role of experts is incredibly important in society and I wouldn't wish to see that undermined by this wholesale collapse in trust.

I believe that humanity has a bright and interesting future, in which we will live longer and richer lives, aided by technology. But first we need to navigate the coming years of transition, and to do that we need great leaders who can persuade us to adapt to this brave new world.

Lynda Gratton is Professor of Management Practice at the London Business School. She is the author of several books, including 'The Shift', about the impact of technology and other changes in business, and most recently, together with distinguished economist Andrew Scott, 'The 100-Year Life: Living and Working in an Age of Longevity'.



THE NEW PLANETARY ORDER



PARAG KHANNA
STRATEGIST, RESEARCHER ON GLOBALISATION
AND CNN GLOBAL CONTRIBUTOR

How the twenty-first century has become dominated by connectivity, and how a new global network is uniting East and West, humanism and science, and democracy and technology.

In the early years of the twenty-first century, anti-globalisation activists descended by the thousands on major international summits and negotiations from the World Bank and the IMF to the World Economic Forum. Protesters representing interests ranging from Western labour unions to African farmers decried the unfairness of globalisation, claiming it exacerbated north-south divides. Today we know they were wrong, and so do they. That's why the protests stopped.

The 'anti' movements – anti-capitalism, anti-technology, anti-globalisation – always lose. They represent not universalistic humanism but parochial shortsightedness. Too little trade is a much bigger problem than unfair trade, too little internet access is a much bigger problem than the digital divide, too little wealth creation is a much bigger problem than high inequality, and too few genetically modified crops is a much bigger problem than corporate farming. Decades of UN declarations calling for global economic redistribution would never have achieved what globalisation has in a few short decades. When Bill Gates said in 2014 that the “world is better than it's ever been” we have globalisation to thank.

The future always comes faster than we expect. Our ancestors awoke not knowing the world is round. Today we wake up knowing we are connected to a global grid with only a few degrees of separation between any two people. There is no doubt that connectivity brings greater complexity and uncertainty, yet the places where one can be sure that tomorrow will be the same as today are often the places one would rather not be.

If the world population has a common goal, it is the quest for modernisation and connectivity – the latter a principal path to the former. Connectivity is unquestionably a greater force than all the political ideologies in the world combined. Deng Xiaoping, who managed to dismantle the Soviet-style communes of Mao's Great Leap Forward and even opposed the Cultural Revolution, subsequently launched the reforms of the 1970s that connected China to the world economy and catapulted it from backwater to superpower. The same is true of religions. In most places, religion and the marketplace peacefully coexist. The religious revival among the newly minted middle-class Indians and Chinese has much to do with showing gratitude and praying for continued success in the global economy. Both societies know that without connectivity they would have much less to be grateful for.

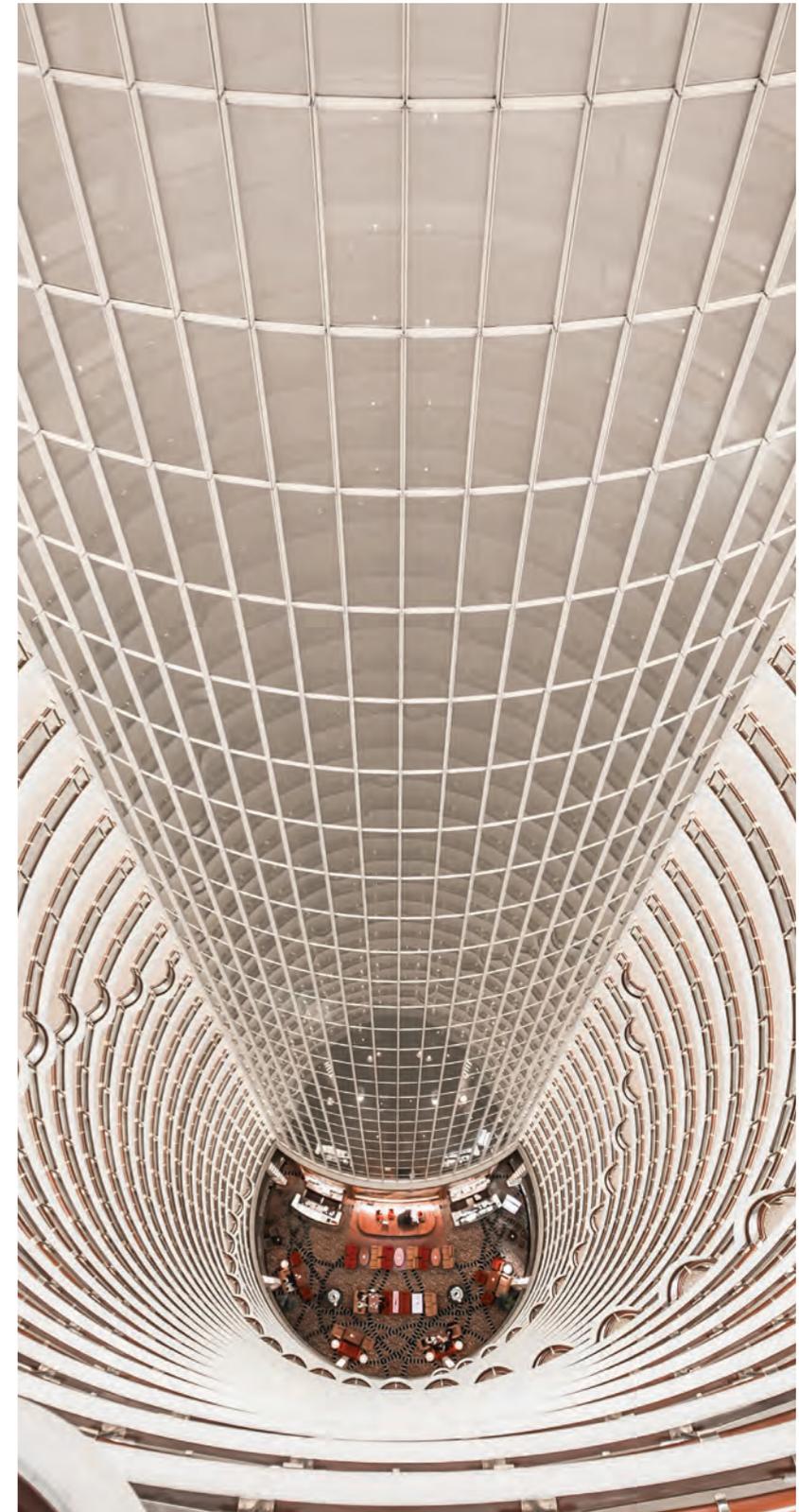
Connectivity has become the foundation for global society. After all, individuals connect with the rest of the world not through politics but through markets and media. Supply chains literally embody how we (indirectly) feel about each other: low-wage Asian workers keep the price of mobile phones down for consumers worldwide, Al-Qaeda militants attacking a Saudi Arabian oil refinery spike gas prices for urban commuters, and Indian and Filipino call center workers solve everyone's tech conundrums. Whatever the degrees of separation, supply chains connect the Bangladeshi garment worker to the Saks Fifth Avenue shopper, and the Congolese miner to the diamond-crusted Vertu phone customer in Hong Kong airport. Nothing connects rich and poor, East and West, North and

South, like supply chains. Tenuous as these links may be, we are more likely to care about things we are connected to than those we are not. Pollution floating over the Pacific from China to California makes Americans think about climate change more than sinking Pacific Ocean islands. The collapse of a garment factory in Bangladesh making clothing for Western brands garners much more attention – and action – than a blaze at a Chinese fireworks plant with few sales outside China. Connectivity enables the empathy that guides our ethical evolution.

A supply chain order is thus not a libertarian fantasy in which markets rule the world. Nor is it universal socialist paradise. It is an evolutionary reality that we should construct pragmatic strategies to harness rather than retreat into populist mythologies and antiquated vocabularies. For nearly a century, the writings of Max Weber have inspired the belief that modern states will ultimately provide the best economic, social, and political foundations of order. But today more than five billion people are chronically under-served and neglected by their national governments.

Even in the West, where the geography of birth has conferred advantages over the rest of the world, a relatively privileged fate is no longer guaranteed. As European governments cut payrolls, millions of citizens have been left to fend for themselves, while America's millennial generation may well fall below the income levels their parents achieved decades earlier. The future will be one of self-sufficiency rather than entitlement: there is no more right to be rich.

There is a false dichotomy between national societies as an organic ethical community versus what Harvard's Michael Sandel calls a “market society” that neglects community bonds. Rather than waiting for governments to provide justice, dignity, and opportunity, people are forming new associations – professional, commercial, virtual – not as a substitute for local social capital, but as an essential new kind of global social capital.



Global connectedness is thus an opportunity to evolve both our cartography and our morality. We should make the most of supply chains rather than just letting them make the most of us. A world remapped according to connections rather than divisions holds the potential to advance a shift from ‘us-them’ mentalities toward a broader human ‘we’ identity. There is no good reason to turn back.

The touchstone of morality in a global society is leveraging connectedness for utilitarian ends: achieving the greatest good for the greatest number of people. We must apply John Rawls’s test of societal morality on a global scale, judging ourselves by how we treat those at the bottom and justifying inequality to the extent that it improves the lives of the poorest. There is still potential to turn what the economist Branko Milanovic calls ‘bad’ inequality into ‘good’ inequality, which motivates and enables efforts for achievement. We are, in fact, on the right track: globalisation and connectivity have improved the quality of life for billions of people even if they have also made high inequality inevitable.

There is no higher morality than allowing people to move to wherever they need to.

The time has come for even bolder thinking about how to leverage near-total connectivity to advance large-scale human development. Infrastructures, markets, technologies, and supply chains are not only logistically uniting the world but also propelling us toward a fairer and sustainable future. But there is still a long way to go. Billions are still without roads and electricity; food is scarce; money is a luxury. Bad infrastructure and bad institutions stand in the way of bridging supply and demand. It is a moral imperative to overcome them.

There is no higher morality than allowing people to move to wherever they need to, whether to avert natural disasters, escape conflict, or search for work, and moving the world’s abundant resources of freshwater, food, and energy to the people who need them. National sovereignty and territorial integrity are no longer sacrosanct principles; in fact, they can be highly immoral when populations are besieged in Sudan and Syria, when drought-stricken climate refugees aren’t relocated to fertile territories, or when migrant workers are trapped in political purgatories rather than empowered to contribute and earn. The shift from political to functional maps helps us overcome rigid moralities that deliver neither justice nor efficiency and adopt a more utilitarian mentality by which governments don’t so much own the world as manage parts of it within a global network civilisation.

The cost of building this new planetary order runs into the hundreds of trillions, and so do its benefits, at least those that can only be measured financially. This, then, is the emergent global social contract: if we can manage to socialise (or even relieve) the costs accumulated in order to unlock the productive potential of billions of underserved and underemployed people, we will also collectively share in the wealth of a much richer global society. There is no formal consensus about what kind of global society we want, even as we are accelerating the construction of it. We should embrace and shape the journey.

Connectivity has also sparked a cognitive revolution by which we come to appreciate globality as a new baseline condition: there is a global dimension to everything. Neither Western nor Eastern ideas dominate, but wisdom flows in both directions, between Western tunnel vision and Eastern holism, between humanism and scientific materialism, between democracy and technocracy. Daniel Bell, a Canadian political theorist at Tsinghua University, argues that harmony is a viable bridge concept between East and West because in Confucian thought, harmony seeks peaceful order but also respect for

diversity in social relationships. It is not premised on uniformity as commonly portrayed. Choosing a seemingly ‘Eastern’ concept such as harmony to drive new metrics would hardly privilege Asia: it is small Western countries such as Norway, Sweden, Switzerland, and New Zealand that rank highest on the Harmony Index. This emergent global culture deepens as the two global languages – English and code – further connect the world through software and real-time communications.

Parag Khanna is a leading global strategist and a CNN Global Contributor and Senior Research Fellow at the Centre on Asia and Globalisation at the Lee Kuan Yew School of Public Policy at the National University of Singapore. He holds a PhD from the London School of Economics, and is a Young Global Leader of the World Economic Forum. He explores this argument in further detail in his recent book, ‘Connectography: Mapping the Global Network Revolution’.

NAVIGATING THE NEW RENAISSANCE



PROFESSOR IAN GOLDIN
PROFESSOR OF GLOBALISATION AND DEVELOPMENT AT THE UNIVERSITY OF OXFORD

The modern Renaissance of globalisation as an engine of creative change, the importance of looking after the have-nots to counter cynicism and pessimism, and how migration can be a driver for economic dynamism.

The world is living through an extraordinarily confusing period of very rapid change: integration, globalisation and extremism, increasing inequality and unpredictable politics. To understand and navigate this new age, which Mikhail Fridman has called the ‘Indigo Era’ a study of the past is as significant as a focus on the present.

While history may not exactly repeat itself, the Renaissance is the moment in history that seems to resonate most strongly with the present. The fifteenth century in Europe was a period of extremely disruptive change not unlike today, and that disruption was caused by technological leaps, such as the Gutenberg press. It was really an information revolution, and the old authorities, notably the Catholic church and the priests, no longer had a monopoly on knowledge.

Ideas travelled extremely rapidly; there was a hunger to learn and humanity’s mental and physical maps were redrawn. Suddenly, we were no longer at the centre of the universe but were revolving around the sun. Europe was no longer the centre of the earth with dragons on the edge, but part of a globe. Taken together, the changes in science and the arts, as famously articulated by Da Vinci, Michelangelo and others, took Europe from being one of the more backward places on the planet in the 1450s to by far the most advanced within about a hundred year period.

So this revolutionary template is useful not only because it helps us understand how information technologies and invention go hand in hand with economic growth and globalisation, but also how, for many people, that period ended in tears. The economic disruption led to widespread hardship,

which in turn fed political confusion and extremism.

In many ways the monk Girolamo Savonarola (who overthrew the Medici in Florence) was what we would today call a jihadist, a fanatical individual who believed that the waves of modernisation had led to a corruption of values. He used pamphlets to capture the imagination of people who felt left behind by the pace of change.

They saw the gold coming back from the New World being put on the domes of their cathedrals, they saw people walking the streets wearing silks, and they saw the new foods and spices, but they didn’t feel part of this progress. A feeling of resentment grew, that change had actually led not only to a challenge to everything that they’d held dear, but also a very rapid rise in inequality. The response was extremism, inquisitions and religious wars.

This seems like an incredibly close parallel to today. Since 1990, not only have physical walls been torn down around the world, but 55 countries have become democratic, China has opened up, and the Soviet Union has collapsed, along with military dictatorships across Africa, Asia, and Latin America.

Simultaneously, in 1990 we saw the launch of the world wide web, which now connects three billion humans. We have moved from a world in 1980 where only 56 per cent of people were literate, to today, when the number is 84 per cent and rising.

This exponential increase in human communication has, just as during the Renaissance, acted as a super-powered engine of creative change and disruption. It has led to the most rapid

developmental progress our species has ever known – life expectancies have improved and incomes have soared – which is why I believe so strongly in globalisation.

Yet at the same time the response of citizens around the world really contrasts with the optimism that people should feel during this new Renaissance. People feel very, very frightened by change; they believe it has brought more harm than good, and they suspect that the next generation will be worse off than they have been. The life expectancy of white American males is not improving, and the chances of escaping poverty in the mid-West US today is lower than it was a generation ago.

Around the globe, people are concerned about terrorism, cyber attacks, migration, pandemics, and of course systemic crises – of which the financial crash was the most prominent example. They worry about the unintended consequences and accelerated development. They feel angry and they blame their woes on authority, which is usually represented by centrist parties. Then it's the extremists, people like Donald Trump or Bernie Sanders, the Corbyns and the Farages, who are the political beneficiaries of the people's desire to challenge traditional authority. Once again, this is exactly what happened in Renaissance Europe.

So the question now is how we are to sustain this Renaissance, because if the current forces of reaction are left

unmanaged, if we take for granted that somehow progress just moves forward, then the anger in the street will lead to more nationalism, protectionism and xenophobia. It will lead to this period of Renaissance ending – and our time being characterised not by the most remarkable progress, but by a series of systemic crises.

So it's vitally important that we understand how precious this moment is, how wonderful it is, and how much it will benefit the world if we manage to sustain it. In order to do so, we need to learn some hard lessons.

We need to look after and to help the have-nots who feel left behind. In a strange way, you have to be more interventionist when change happens more rapidly because people are being left behind more quickly. That intervention needs to enforce flexibility. It means that if you're in a town in which industry is collapsing, you have to move towns, so you need housing markets and transport systems that work. It means that if your skills become obsolete, you need to retrain, so we need more flexible education systems.

But it also means that we are going to need more social welfare support, because our societies will churn in the job market much more rapidly in the future. So we need to work out how to pay for that, how to raise the money through tax, how to ensure that successful corporations and individuals shoulder their responsibility in society.

Another hard lesson is that we need to manage better the risks of being more joined up as a world. The financial crisis was a massive wake up call, because our central banks and treasuries are amongst the most effective international institutions, and yet they were completely blindsided.

On the other hand, more systemic risks, like a health pandemic, would need to be managed by global institutions like the World Health Organisation and the United Nations, but these are in fact becoming less effective as we starve them of the necessary leadership and resources, with the result that at precisely the time we need more effective global institutions, they are weak, have not adjusted to the new world and are undermined.

Another lesson we need to learn is about globalisation, which I believe is

This exponential increase in human communication has, just as during the Renaissance, acted as a super-powered engine of creative change and disruption.

a hugely positive force. The data show that emerging markets on average are growing at three to five times the rate of the advanced economies (if we set aside countries like Syria and other failed states). At present, it's not the case that advanced economies are the main beneficiaries from our new Renaissance. So we need to argue the case for more openness and more trade, not less.

Then there is migration, which has become the lightning rod for many people's concerns about change around the world, as has often happened in history. But this is not borne out by the facts. Some of the countries in the world with the highest levels of migration, like Dubai, which is made up of 98 per cent immigrants, or Toronto, with its 52 per cent immigrant population, are amongst the most prosperous and stable communities and within our countries, cities like London, and New York thrive in part because they have such a high share of migrants.

I believe absolutely fervently in the economic benefit of migration. The reason why Silicon Valley is the most dynamic place in the US is because of migrants. Nor is there any empirical evidence that migration brings down wages. But we need to go out and win these arguments, as they are collectively part of the threat facing our generation.

Overall then, this new Renaissance, like its predecessor, is a period of huge opportunity, but which also presents enormous risks. If we manage these risks, if we find leaders who can defeat the Savonarolas of our day, then we stand on the brink of a new global golden age. If we fail, then a new dark age beckons.

Ian Goldin is Professor of Globalisation and Development at the University of Oxford. He is the author of numerous books, most recently, together with Chris Kutarna, 'Age of Discovery: Navigating the Risks and Rewards of Our New Renaissance'.



BRITAIN: INNOVATION CAPITAL OF THE WORLD



GEORGE FREEMAN MP
CHAIR OF THE UK PRIME
MINISTER'S POLICY BOARD

How to prepare for a post-Brexit future by investing in our education systems, encouraging innovation in regional hubs outside of London, and propelling Britain towards a future as a digital superpower in the twenty-first century.

Global economic growth will in the future be driven by science and innovation. As a mature Western democracy with an advanced economy, we need to be furthering our competitive advantage by developing the technologies, innovative products and companies of tomorrow, and better globalising and exporting them to the fastest growing economies.

Post Brexit, this will now be an even more important element of our prosperity. With our world-leading universities and venture funding base in the City of London, Britain is brilliantly placed to become one of the innovation capitals of the world. But to do that, we must think strategically about marshalling our resources. That's why I'm delighted that Theresa May has put a twenty-first century industrial strategy right at the centre of her economic programme. In my previous Government role as Minister for Life Sciences, I was responsible for driving through the first ever Life Science and Agri-Tech Industrial Strategies. Now in my new role as Chair of the Prime Minister's Policy Board, I am determined to build on this work and help to drive through this wider agenda of innovation and growth across Government.

As well as delivering and making a success of Brexit, Theresa May has made clear we also need to go further in tackling the domestic root causes of the growing resentment of globalisation and a perceived economic and political powerlessness felt by so many.

Not just in our own country but right around the world people are signalling deep reservations at the

implications of globalisation and the accelerating pace of change that they see in economies and societies. It's the role of governments to navigate this moment of transition and identify and tackle the barriers to widening access to opportunities. As Theresa May signalled in her first speeches after entering Downing Street, we need to respond with a domestic agenda that demonstrates how Britain can thrive in a connected world and create more opportunity in doing so for more of the people and places that have felt increasingly marginalised.

Key to this new model of global growth will be harnessing our status as a science and technology superpower, and using our need to modernise our public services and Government as an engine for early adoption of innovation in the UK. We are already one of the world's most digital economies. Imagine if we also led in e-healthcare, autonomous mass transit, contactless payment and clean energy. Not only would we help tackle our historic productivity and structural deficit challenge, we could become a global hub of innovative businesses and inward investment and exports.

In 30 years' time, I want us as a nation to look back and be able to say that we seized the chance of Brexit to tackle our domestic economic priorities as well as our relationship with the EU, to make the UK a hub of innovation and a technological pioneer. That means embracing the idea of public sector entrepreneurship. The traditional thinking is that the public sector spends money while the private sector generates it. But I believe the public sector can become part of the solution, rather than

the problem. We need to ditch the old thinking of 'private sector good / public sector bad.' To succeed post-Brexit, we need to champion the concept of public sector enterprise, an approach not unlike Team GB at the Olympics, where long-term thinking and ruthless meritocracy in backing winners in a patriotic not-for-profit cause delivered such astonishing success. We cannot afford to leave innovation to the private sector and allow our public services to stagnate. We need bold thinking and new ideas throughout Whitehall as we negotiate our new relationship with Europe and the world.

One way to achieve this is a renewed localism. With public affection for Big Government at an all time low, and Whitehall's coffers under continued pressure, we need to be asking deep questions about how best to harness the many assets we have in Britain. For example: allowing entrepreneurs and council leaders in a place like Cambridge to raise a £2 billion infrastructure bond for the city – or the leaders in Birmingham to raise a Chamberlain-esque 'Brummy Bond,' supporting a new range of mutual companies, and incentivising much bolder local economic business plans;

letting local areas retain more of the proceeds of growth, and go further with what's already been started by allowing local councils to keep more local business rates, so they have a greater incentive to support local economic growth; or allowing the NHS to harness its unique research strengths to become a partner in innovation instead of a customer, negotiating discounts and charging royalties for innovations proven in the NHS. Put all these together and we could use the much maligned public sector to help drive a new model of growth.

Take Norfolk, the area I am so proud to represent as a Member of Parliament, and the wider Eastern region. Having spent fifteen years working as an entrepreneur in East Anglia before coming to Parliament, I believe our area has the potential to be a "New California," a major technological hub including the Cambridge cluster and the Norwich Research Park, with entrepreneurs setting up new businesses across our towns and villages. Though we have come a long way, to achieve this vision we need to continue improving our education system to ensure the companies of tomorrow have the skilled workforce they need, invest much more

in our transport links with faster access to London and upgrade our digital infrastructure, making sure there is high-speed broadband for everyone.

This is the task before us as we shape our future after Brexit. We have a once-in-a-generation chance to seize the opportunities to make the UK the innovation capital of the world, defying the doubters and being clear that we will go on leading the world in science and technology. We have the chance to embrace public sector enterprise, rolling out innovation at scale across our public sector, making the NHS a pioneer in the new model of twenty-first century healthcare just as it was with twentieth century healthcare. Most of all, we have a chance to show how this new model will benefit all in our society, creating an economy that works for everyone and restoring faith in the power of politics as a force for change.

George Freeman is the MP for Mid Norfolk, former Minister for Life Sciences and Chair of the Prime Minister's Policy Board. Before his election to Parliament, he had a 15 year career in biotech venture capital.



THE COLLAPSE OF COOPERATION



DAVID LIPTON & IAN BREMMER

DAVID LIPTON IS THE FIRST DEPUTY MANAGING DIRECTOR OF THE INTERNATIONAL MONETARY FUND

IAN BREMMER IS A POLITICAL SCIENTIST AND GLOBAL RESEARCH PROFESSOR AT NEW YORK UNIVERSITY

How an erosion of popular political support is giving rise to populism and discontent, how the disruptive technologies of bitcoin, big data and artificial intelligence may challenge legal and regulatory systems, and why it is vital to provide displaced workers with the skills that will enable them to compete in the twenty-first century global economy.



Too often, a spirit of international cooperation evaporates just when it is most needed and most promising. And then, lack of cooperation leads to crisis; crisis belatedly forces cooperation; but that cooperation must begin with picking up the pieces.

We saw this during the Great Depression when the international community was unable to find common ground and cooperate on monetary, exchange rate, and trade policies. Then in the wake of the Second World War, perhaps the single greatest cataclysm in history, the painful lessons of that failure gave birth to the economic and political cooperation we have known all our lives. Now, as the forces of economic and political fragmentation rise again, are we fated to repeat the mistakes of our history?

For two generations, countries supported a global order based on institutional arrangements aimed at protecting economic stability and safeguarding security. That order, although imperfect, commanded broad support by permitting meaningful and constructive international cooperation while sufficiently preserving national prerogatives and sovereignty to receive broad and continued support. Through long periods of prosperity punctuated by recession, and throughout the Cold War and its aftermath, that order produced decades of economic progress and stability, and unprecedented

increases in living standards lifted hundreds of millions out of poverty and created a global middle class.

GROWING DISCONTENT

Today, however, we are witnessing rising challenges to the global order, including an erosion of popular support, and a deepening atmosphere of uncertainty. On the economic front, there is growing discontent in advanced economies stemming from the damage of the global financial crisis, slowing income growth, technologies that make many jobs obsolete, and the individual and community displacement that comes from global interconnectedness. The downsides of modern capitalism have now appeared in sharp relief.

Stagnant middle class wage and job growth and rising inequality are fraying the social contract. Opportunistic political leaders are successfully playing on fear of fast-moving change that seems beyond the control of ordinary citizens – and even of their elected representatives. In the United States, economic progress by minorities and women, celebrated by many, has provoked a backlash from those who feel they are falling behind. Some emerging market economies are struggling to cope with the yawning gap between the rising expectations of the new middle class and the ability of governments to deliver amid slowing global and domestic growth.

But the challenges extend beyond economics. Indeed, economics, politics and security are becoming inextricably intertwined in our world. Most importantly, the global political landscape is changing. For almost a decade, the United States and Europe have concentrated political energy on recovery from the global financial crisis, and that focus has sapped the will to engage proactively with the wider world. At the same time, China's rapid growth and active involvements in Asia and Africa are tilting the global balances of economic and political power. Despite some slowdown, China still accounts for 37 per cent of all global growth. The emerging market countries are rightfully demanding a greater say in international forums and institutions.

We are witnessing rising challenges to the global order, including an erosion of popular support, and a deepening atmosphere of uncertainty.

GEOPOLITICAL FORCES

Meanwhile, the emergence of non-state actors imposes new threats and costs that make cooperation more complicated. Wars in the Middle East have bred failed states, the rise of so called Islamic State, and a flood of refugees that burden the region and Europe. Terrorism and cyber threats are now worrisome facts of life for all countries. These issues can be dealt with only through international cooperation.

In the geopolitical realm, there are other important factors that complicate cooperation. While not a new phenomenon, there is strong resentment of the United States' tactics, including its frequent use of sanctions, which is viewed as a 'weaponisation of finance' attacks from unmanned drones within the borders of other countries, and surveillance on foreign leaders.

European leaders face a formidable set of internal problems – including managing the refugee crisis, negotiating Brexit, controlling terrorism, and placating populations weary of reform and change.

Finally, the emerging powers – Brazil, India, China, Russia, and South Africa – and others aspire to more influence in their regions and in the world, along with power and influence in global institutions commensurate with their growing international importance and interests. Unconvinced that advanced countries will cede this ground, even over time, they have proposed and funded alternative approaches, either through the creation of institutions like the Asian Infrastructure Investment Bank and the emerging market economies' New Development Bank, or by stepping up their own national efforts to support development and extend their influence abroad.

Where governments can meet their citizens' expectations for rising living standards and enhanced personal security, populist messages lose their urgency and appeal.

Yet another dimension adding to complexity comes from disruptive new technologies, including advances in information, Bitcoin, big data technologies, and artificial intelligence. These developments hold great promise, but they raise questions about the profitability and sustainability of existing institutions and companies, and may erode the effectiveness of existing legal and regulatory systems.

Because these trends make the future uncertain, they may also stunt demand by prompting precautionary savings and keeping nervous investors on the sidelines.

WHAT IS TO BE DONE?

To repeat a question famously posed early in the last century when the global order was being called into question, 'What is to be done?'

The irony of the present predicament is – as we said at the start – that there is more to be achieved by interconnectedness and cooperation than ever. If the advanced economies face a tougher challenge as they mature and productivity growth slows, they can hardly afford to throw away the gains from trade. The emerging markets will continue to depend on the trade, capital and technology that are part and parcel of interconnectedness if they are to sustain and eventually accelerate high growth rates and achieve a convergence of living standards.

It is essential to protect the gains from globalisation by banding together to revitalise growth. The Group of Twenty (G20) advanced and emerging market economies continues to play an essential role in this process. By acting together, much more is possible and feasible.

But as we do so, we must make our global and national economies more inclusive to reduce the economic insecurity and rising inequality that has accompanied globalisation. In a capitalist society, most change creates winners and losers. We also recognise that geopolitical 'creative destruction' is exacerbating the anxiety provoked by economic displacement.

So, our efforts to lift growth must be accompanied by policies that support the poor and those displaced or negatively affected by change. Our countries must be more open to redistributive policies. That requires a particular focus on providing displaced workers – both in industry and services – with the skills that will enable them to compete in the twenty-first century economy. Where governments can meet their citizens' expectations for rising living standards and enhanced personal security, populist messages lose their urgency and appeal. Prosperity, in turn, bolsters security and geopolitical cooperation.

There is a lot of fanciful talk about building walls these days. In reality, the defensive wall we need is to improve the international community's firewall against future crises. That effort requires better coordination to limit spillovers due to economic vulnerabilities; stronger financial regulations to prevent banking and capital market abuses; and tax cooperation and harmonisation to limit the national revenue erosion that results from cross-border profit shifting by corporations.

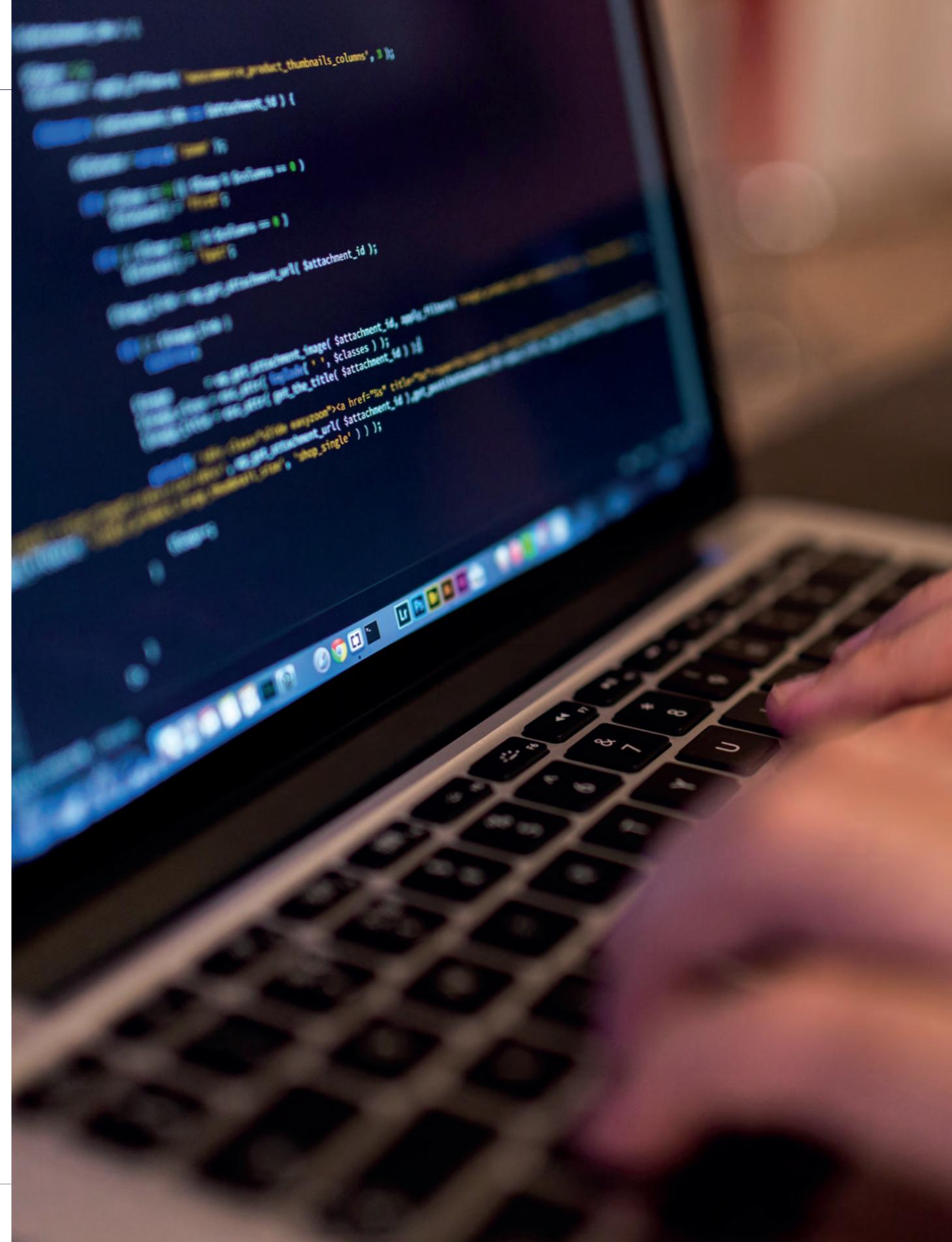
These efforts call for a closer embrace of the multipolarity of our world. We need to protect and, where necessary, reform core multilateral institutions like the International Monetary Fund, World Bank, and United Nations. Their continuing influence depends on letting governance evolve to reflect changing global power realities. The same approach implies supporting and integrating the new institutions and initiatives promoted by the emerging markets.

Lastly, the time has come to break down the longstanding divide between economics and security in national and international policymaking. The two are inseparable in a globalised world where territorial disputes and market volatility can reverberate and disrupt without regard to our twentieth century constructs. Moreover, only an integrated approach – one that recognises that security threats have economic repercussions, while economic instability generates security threats – can navigate the hazards of failed states, non-state actors, and regional conflicts to secure a peaceful and stable world.

To avoid repeating the mistakes of our history and succumbing to economic and political fragmentation, the time has come for serious dialogue and a renewed spirit of cooperation.

David Lipton is the First Deputy Managing Director of the International Monetary Fund. Previously he was Special Assistant to President Obama.

Ian Bremmer is a political scientist and Founder of Eurasia Group, a political risk research and consultancy firm. He is the former Editor-at-Large of TIME magazine.



APPENDIX: INDIGO SCORE TABLES

Rank	Country	Stability & Legal	Creativity & Innovation	Economic Diversity	Digital Economy	Freedom	Indigo Score
1	Sweden	189.3	217.2	172.9	196.8	203.5	195.9
2	Switzerland	193.2	212.1	183.7	165.0	199.6	190.7
3	Finland	195.3	218.2	156.4	178.6	204.6	190.6
4	Denmark	186.5	216.1	170.2	173.2	206.1	190.4
5	United Kingdom	170.8	203.1	195.8	187.6	187.8	189.0
6	Netherlands	186.5	198.4	155.3	191.4	206.9	187.7
7	Norway	190.6	203.1	157.3	172.7	210.4	186.8
8	Germany	179.8	194.7	184.4	181.7	193.1	186.7
9	Ireland	181.3	197.4	167.2	165.0	194.3	181.0
10	Japan	174.9	183.0	204.5	179.4	161.4	180.6
11	Australia	185.1	169.0	178.2	165.8	196.2	178.8
12	France	162.7	205.4	194.7	161.9	169.1	178.8
13	Austria	184.7	173.0	169.9	168.6	196.2	178.5
14	Belgium	171.0	193.1	180.7	150.4	191.6	177.4
15	Estonia	165.9	217.8	135.6	180.4	185.5	177.0
16	Singapore	177.7	206.8	199.5	200.6	96.4	176.2
17	Canada	186.5	176.0	167.0	159.4	191.6	176.1
18	United States	166.7	188.0	164.4	180.1	174.8	174.8
19	Spain	151.5	209.5	192.4	141.4	173.3	173.6
20	New Zealand	195.8	131.8	169.9	147.3	208.1	170.6
21	Portugal	162.8	190.7	169.9	139.4	182.4	169.1
22	Italy	142.2	202.1	186.7	152.5	159.1	168.5
23	Korea, Rep. (South)	151.0	174.0	190.5	178.3	147.2	168.2
24	Luxembourg	189.5	188.7	143.1	155.5	162.9	168.0
25	Czech Republic	161.7	140.5	162.2	180.9	176.7	164.4
26	Poland	159.1	193.4	137.9	171.7	157.6	163.9
27	Iceland	183.1	199.4	145.9	127.3	162.2	163.6
28	Slovenia	158.2	232.2	118.9	124.3	179.0	162.5
29	Hungary	146.3	203.8	159.6	159.6	141.5	162.2
30	Lithuania	157.6	207.1	129.9	137.8	161.4	158.8
31	Chile	163.1	149.6	155.3	153.7	166.0	157.5
32	Latvia	150.7	193.1	121.6	156.8	159.1	156.3
33	Uruguay	159.9	154.9	120.5	137.3	185.5	151.6
34	Costa Rica	149.4	145.9	106.3	169.4	179.8	150.1
35	Hong Kong SAR, China	157.9	127.1	188.3	170.6	102.1	149.2
36	Israel	117.2	156.9	181.8	172.7	113.2	148.4
37	Slovakia	154.3	115.8	142.7	165.3	163.7	148.3
38	Croatia	139.3	175.3	134.9	116.8	153.0	143.9
39	Cyprus	155.1	174.0	90.5	121.2	164.5	141.0
40	Malta	169.5	129.5	99.4	157.1	145.7	140.2
41	Bulgaria	121.1	177.0	141.5	127.6	118.6	137.2
42	Greece	127.0	172.3	142.0	105.3	133.1	135.9
43	South Africa	120.8	112.8	158.3	139.9	142.3	134.8
44	Argentina	89.6	136.8	150.2	145.3	151.5	134.7
45	Brazil	109.0	116.4	177.0	146.8	119.7	133.8
46	Malaysia	135.4	136.8	149.6	179.4	64.6	133.1
47	Serbia	114.1	152.6	143.8	118.1	133.5	132.4
48	Mauritius	155.3	72.3	96.4	149.6	162.5	127.2
49	Panama	121.6	108.7	145.7	98.4	145.3	124.0
50	Ukraine	55.4	185.0	148.4	119.7	94.1	120.5

Rank	Country	Stability & Legal	Creativity & Innovation	Economic Diversity	Digital Economy	Freedom	Indigo Score
51	Russia	59.7	177.7	171.5	163.2	29.1	120.2
52	Montenegro	125.1	145.2	118.2	118.1	92.6	119.8
53	Georgia	115.9	109.1	127.6	106.6	104.4	112.7
54	Botswana	148.3	76.0	109.0	80.5	149.5	112.6
55	Philippines	83.7	95.0	135.1	153.2	95.6	112.5
56	Romania	123.1	132.2	29.8	140.2	133.1	111.7
57	Mexico	86.5	106.7	150.0	114.8	88.7	109.3
58	Mongolia	114.8	103.4	102.4	87.9	137.7	109.2
59	Turkey	91.4	149.2	137.0	102.5	65.0	109.0
60	Colombia	77.3	115.1	139.9	117.6	94.9	109.0
61	Macedonia	122.1	115.1	102.4	110.2	94.1	108.8
62	Jamaica	114.9	64.6	120.0	76.1	162.2	107.6
63	Thailand	82.6	96.4	154.8	144.3	54.7	106.5
64	Indonesia	87.9	68.3	156.0	128.6	86.1	105.4
65	China	78.3	138.2	151.2	146.3	12.6	105.3
66	Peru	86.5	92.0	133.1	91.0	119.7	104.4
67	Moldova	88.4	125.5	101.9	93.8	110.9	104.1
68	Kazakhstan	85.2	149.6	120.5	133.0	21.0	101.8
69	United Arab Emirates	146.1	121.1	93.0	113.5	34.8	101.7
70	El Salvador	98.9	58.6	118.4	97.6	131.2	100.9
71	Namibia	129.3	49.9	87.9	95.6	137.7	100.1
72	Tunisia	82.6	98.4	128.3	87.1	97.5	98.8
73	Trinidad	119.8	81.0	46.3	79.9	150.3	95.5
74	Jordan	95.3	115.8	124.8	105.3	35.2	95.3
75	Bosnia	95.1	106.1	107.4	67.1	94.9	94.1
76	Qatar	143.9	79.6	70.8	128.6	44.7	93.5
77	India	78.3	37.1	156.2	104.5	87.2	92.7
78	Belarus	71.4	128.8	139.5	88.4	27.5	91.1
79	Albania	113.4	62.9	94.6	68.7	114.0	90.7
80	Barbados	166.6	41.2	66.6	122.7	50.5	89.5
81	Morocco	90.1	46.8	132.1	119.4	54.3	88.6
82	Dominican Republic	94.8	80.6	107.0	73.3	81.8	87.5
83	Suriname	103.3	37.1	66.2	98.1	131.2	87.2
84	Armenia	91.2	93.7	77.0	93.3	78.4	86.7
85	Kuwait	107.2	96.7	2.1	149.1	55.1	82.0
86	Bolivia	61.0	75.6	108.8	53.5	110.5	81.9
87	Bahrain	97.3	75.3	59.3	150.7	18.4	80.2
88	Guatemala	59.7	59.6	95.5	88.7	95.2	79.7
89	Belize	94.5	79.3	80.6	39.5	101.7	79.1
90	Lesotho	86.6	26.4	73.3	79.4	126.6	78.5
91	Paraguay	70.5	79.3	43.1	86.3	109.8	77.8
92	Ghana	106.4	33.1	35.0	67.6	143.8	77.2
93	Kyrgyzstan	45.6	91.3	97.3	74.3	76.5	77.0
94	Ecuador	65.2	108.1	31.4	76.1	101.4	76.4
95	Vietnam	82.7	67.6	72.4	136.3	18.7	75.5
96	Oman	130.3	82.0	17.4	106.3	40.2	75.2
97	Guyana	83.9	35.5	68.2	58.7	122.8	73.8
98	Kenya	51.8	46.2	122.3	77.9	70.8	73.8
99	Lebanon	48.9	79.3	73.3	95.3	70.0	73.4
100	Sri Lanka	82.9	73.9	57.7	81.5	60.8	71.4

Rank	Country	Stability & Legal	Creativity & Innovation	Economic Diversity	Digital Economy	Freedom	Indigo Score
101	Saudi Arabia	93.5	98.7	26.3	126.3	7.6	70.5
102	Honduras	58.4	53.9	88.9	73.3	77.6	70.4
103	Brunei	147.9	57.9	30.7	76.1	32.5	69.0
104	Egypt	37.9	87.0	95.7	96.1	21.4	67.6
105	Azerbaijan	61.0	97.7	77.0	82.0	18.7	67.3
106	Nicaragua	69.6	59.9	41.2	69.9	95.6	67.3
107	Senegal	96.4	38.1	38.2	51.5	110.5	67.0
108	Algeria	44.1	56.9	104.0	79.7	43.2	65.6
109	Cuba	90.1	121.5	66.4	15.6	22.2	63.2
110	Pakistan	32.4	45.5	128.0	71.5	33.3	62.1
111	Cambodia	56.6	34.1	85.9	69.2	62.7	61.7
112	Zambia	89.6	29.4	66.4	34.8	85.7	61.2
113	Rwanda	96.0	28.1	69.6	75.3	28.3	59.5
114	Venezuela	29.4	100.7	28.4	74.6	63.9	59.4
115	Uganda	51.2	23.1	90.9	63.0	67.3	59.1
116	Benin	82.4	23.8	41.2	45.6	101.0	58.8
117	Bangladesh	42.2	31.5	110.2	44.1	65.4	58.7
118	Nepal	51.0	30.4	48.6	69.9	83.8	56.7
119	Malawi	76.8	20.4	27.0	54.6	104.8	56.7
120	Swaziland	66.2	42.5	82.2	53.0	27.2	54.2
121	Burkina Faso	62.3	30.1	43.5	29.7	102.9	53.7
122	Sierra Leone	50.2	8.0	66.2	43.6	89.1	51.4
123	Mozambique	63.1	33.1	43.5	34.1	79.9	50.8
124	Iran	38.1	88.7	69.6	41.0	7.6	49.0
125	Gabon	79.8	32.8	2.7	48.7	73.8	47.6
126	Madagascar	50.7	13.7	68.5	16.1	88.0	47.4
127	Tajikistan	36.3	86.3	51.3	34.1	28.7	47.3
128	Uzbekistan	38.1	90.3	66.0	28.4	11.5	46.9
129	Haiti	27.5	15.1	89.3	13.8	83.8	45.9
130	Mali	43.8	26.4	12.8	56.6	87.6	45.5
131	Cameroon	31.7	46.5	53.4	37.2	42.1	42.2
132	Liberia	44.3	12.7	37.3	14.9	99.1	41.7
133	Nigeria	22.9	27.4	60.0	50.0	45.5	41.2
134	Togo	48.4	32.5	35.0	21.8	63.5	40.2
135	Gambia	64.2	16.1	25.0	52.8	40.9	39.8
136	Mauritania	43.0	9.7	28.2	50.5	66.9	39.7
137	Ethiopia	43.0	56.5	21.8	35.9	32.1	37.9
138	Niger	44.6	10.4	19.7	22.5	91.8	37.8
139	Laos	69.3	68.3	6.9	23.8	16.4	36.9
140	Cote d'Ivoire	47.7	15.4	26.1	50.0	19.9	31.8
141	Afghanistan	11.1	22.1	47.0	30.2	36.3	29.3
142	Burundi	31.6	29.1	9.2	32.8	32.5	27.0
143	Yemen	11.0	13.7	60.5	37.9	8.4	26.3
144	Guinea	24.2	6.7	26.3	21.5	52.4	26.2
145	Angola	36.9	24.8	1.6	18.7	45.5	25.5
146	Djibouti	45.6	4.0	38.9	8.7	29.4	25.3
147	Zimbabwe	21.6	21.7	17.2	32.5	28.7	24.3
148	Central African Republic	6.5	17.7	23.8	29.5	34.0	22.3
149	Myanmar	19.5	28.4	12.8	14.3	29.1	20.8
150	Syria	5.4	54.9	13.3	18.2	4.2	19.2
151	Iraq	12.6	18.7	13.7	21.0	29.1	19.0
152	Chad	12.8	11.4	9.4	5.4	42.8	16.3



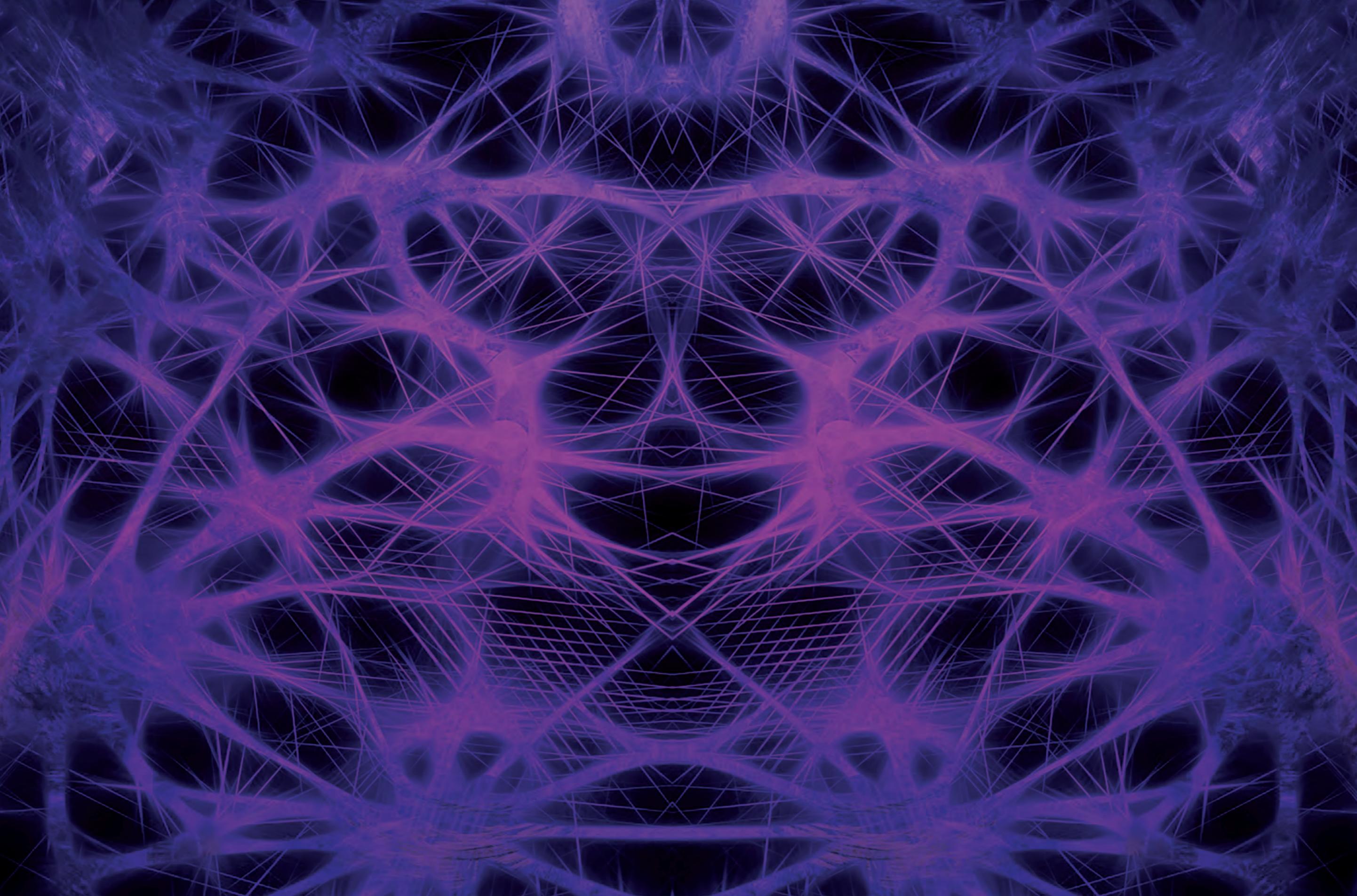
SYMBOLISM OF INDIGO

Rarely occurring in nature, its symbolism is shrouded in intrigue. The status of indigo as one of the colours of the rainbow is a point of contention: many argue that it does not belong on the spectrum at all, instead falling under the categories of one of its neighbours, blue or violet. The visual difficulty in differentiating its hue in the rainbow spectrum adds to its ambiguity, and supports the concept that it represents a mixing, meshing, and merging of two related, but different, ideas.

Traded since the fifteenth century and used to dye cloth, indigo has a rich history as a valuable commodity. It was imported in trade routes across continents via the Silk Road from India and traded for centuries, epitomising its role as a uniting force: in this case, that of East and West. Today, developments in dyeing technology mean that it can be produced artificially, making it ubiquitous in denim jeans. The tension between artificiality and authenticity, the manufactured form and the natural state, reinforces and reflects the new economic era into which we are entering, in the move away from the value of natural resources to that of innovation and creativity, driven by technology and man-made resources.

The colour indigo has also held a significant place in religious contexts. Christian art often depicts the Virgin Mary as clothed in a shade of blue. The colour indigo has been suggested as similar to the unidentified colour of techelet, the colour of the fringed robes worn by Ancient Israel's high priests in the Second Temple in Jerusalem. Intense debate surrounds what exactly the biblical text meant by this colour; many attest that it is similar to indigo, and the search for its alleged natural source, the chilazon snail, continues, adding to indigo's elusiveness.

Indigo as a personality trait is related to spiritual thought. People with indigo personalities are characterised as insightful, creative, resistant of authority and structure, and fiercely iconoclastic. This embodies a breaking of the norm, something that is highly reflective of the new era that we are entering into, one that lacks convention and is driven by innovation.



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LETTERONE

VOLUME N^o. 1
NOVEMBER 2016