

OFF THE PAGE

*SOME OF THE INSPIRING AUTHORS
WE HEARD FROM IN 2019*



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02

MAN-MADE PROBLEM

04

EYE ON THE PRIZE



06

SAVING THE SYSTEM

08

INHUMAN INSTINCT



10

WHO WANTS TO LIVE FOREVER?

12

RETAIL IS CHANGING NOT DYING



14

NUCLEAR REACTION



OFF THE PAGE

At Baillie Gifford, we love authors. Our literary sponsorship programme is evidence of the importance we place on the work of great writers. This support is a crucial strand of the relationships we nurture with experts and academics – something that distinguishes us from many of our competitors.

We sponsor literary events across the UK. In 2019, these spanned much of the calendar, starting at York in March and concluding in October with Cheltenham and Wimbledon. We discovered many impressive authors who have written on subjects of interest to us as investors, and as individuals living on a planet that is wrestling with countless troublesome issues while also brimming with exciting opportunities.

Our support allows the voices of these fascinating authors to be heard, whether that be at firmly-established events, including Hay Festival and Edinburgh International Book Festival,

or the relative newcomers such as Chiddingstone Castle Literary Festival which is the latest addition to our sponsorship programme.

Although the main thrust of our support is to ensure festivals attract brilliant and spellbinding writers, we sometimes have the added benefit of private interactions with them, either in one-to-one interviews or sessions exclusive to Baillie Gifford staff.

In the following pages, we're happy to share with you some of the insights we gleaned from our experiences this year. We hope you enjoy reading them.

MAN-MADE PROBLEM

Tiffany Jenkins hears Caroline Criado-Perez talk to Lynn Dewar, a partner at Baillie Gifford, about her anger at discovering the ‘default human’ is male.

In 2012, an advert for a range of Bic ballpoint pens available in pink or purple and designed to fit a woman’s hand went viral. The writer and activist Caroline Criado-Perez recalls firing off a litany of questions to the marketing department about the ‘Bic for Her’ line. “I thought, women on average do have smaller hands than men. Maybe there is some kind of research done, that discovered that the old Bic pens were unsuitable for women’s hands.”

It’s her favourite example of the influence of ‘Reference Man.’ When everything in society is designed around and for the average man, men are the default; women the outlier. “So we have ‘ladies’ deodorant, even ‘ladies’ laxatives!” She shakes her head at the folly of these branding exercises. After an email to-and-fro, the Bic marketing department admitted that ‘Bic for Her’ was not based on science, but fashion and design. A clipped sentence at the end of the email implicitly acknowledged the PR fail and its potentially damaging commercial implications: ‘Bic for Her range has now been discontinued.’ It had been subject to global mockery.

It’s an amusing example in the service of a serious point. “We all do this” Criado-Perez explains, “not just marketeers. We all think of men as the default person.” The world is built

and organised for men, overlooking half of humanity. She rattles off numerous cases, one illustrating that the gender data gap can have deadly consequences.

“Women don’t present with heart attacks in the same way men do” (few suffer chest pain; they’re more likely to have breathlessness, nausea and fatigue, which looks like indigestion), but the diagnostic criteria for heart attacks are all based on the male experience. “Doctors send women home and they die.”

So, why does it happen? The unsatisfactory answer given by companies and institutions is that women are “too complicated” to measure. But the gender data gap, she emphasises, is “not a conspiracy.” When Apple’s health tracker initially tracked everything from steps to copper intake but failed to track periods, it wasn’t due to misogyny. They just didn’t think about it. “They forgot that periods happen to half the population, because there wasn’t a woman in the room.” As for what else needs to be done, she suggests that though she can expose the gender data gap, she may not be the best person to come up with solutions. Though, when pushed on her ‘dream’ policies, she is forthcoming. First up, “free nationalised childcare.” Next, “use-it-or-lose-it paternity leave.” Then,



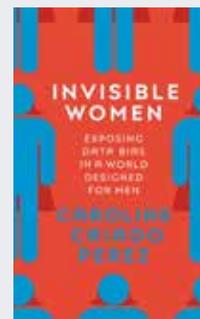


educating the young. She bought her nephew a plastic T-rex after he had assumed that dinosaurs were boys. “This, I told him, is Shirley.”

Moving on to recruitment, she argues unapologetically for quotas: “They work.” She expands “all the research shows is that they don’t elevate women who don’t deserve it. What they do is prevent mediocre men from being elevated.” That’s not her language, she is quick to note, “but the LSE’s.” Make sure there is “diversity,” and stay away from the algorithms when hiring. “Artificial intelligence just amplifies the bias,” she warns.

The list of recommendations continues, and Criado-Perez is on a roll. With a slightly worrying aside, “if people know they are being watched, they will behave better,” she stresses the need for companies to be “incredibly transparent.”

“Managers should have to go and defend their promotion and hiring decisions.” The audience shifts a little in their seats, but she smiles back, confident in her point.



Caroline Criado-Perez has written *Invisible Women: Exposing Data Bias in a World Designed for Men*.

EYE ON THE PRIZE

Sir Venki Ramakrishnan explains to Marina Record, an investment manager at Baillie Gifford, that the life of a scientist is not all that we expect. Colin Renton reports.

Our impression of science is defined by myth according to Sir Venki Ramakrishnan. Part of the motivation to write *Gene Machine* – an account of his life and career – was to dispel that mistaken view and show that scientists are not as rational as the stereotype suggests.

“I wanted to get away from the notion that science is a series of logical steps that just flow from one to the next”, he explains during a private session in Baillie Gifford’s Edinburgh office. “In fact, science is extremely messy. You make all sorts of mistakes. Most experiments don’t work, sometimes, in hindsight, because you were stupid and didn’t see something obvious.

“There is also the human element. Scientists are motivated by lots of things: curiosity; sometimes by the desire to do something beneficial for the world; sometimes we are motivated by money, making a discovery that is going to make us rich.”

As he states in the book, curiosity was the main catalyst in a career that has seen him become a respected researcher of global repute at the Medical Research Council Laboratory of Molecular Biology in Cambridge, president of the Royal Society, and a Nobel Prize laureate. However, there were other important factors, among them the desire to succeed, to be first and to be recognised for making discoveries.



The book exposes the competitive undercurrent that flows through the scientific world. He admits that knowing he was on a Nobel shortlist had a corrosive effect on his work. A subsequent belief that he was out of the running for the award released him to refocus on activity in the laboratory. Ironically, being more relaxed ultimately contributed to the work that won him the prize for his research into the structure of the ribosome, a small structure in cells that produces protein.

A physicist who switched to biology, Ramakrishnan took up his position at Cambridge in 1999. The achievements of his laboratory have fed further success and made it a desirable place to work. That has helped attract talent from many countries, a fact that does not surprise him.

“Science, almost more than any field, even more than music or art or literature, is truly international. A ribosome biologist in China or India or Australia will have absorbed the same knowledge and when you meet them you can talk the same language. If a science lab is really terrific it will be truly international because people from all over the world will want to come and work there”, he explains. “When it is international, people come and bring new ideas, new expertise, new ways of doing things, and new attitudes. Being international helps science.”

The laboratory’s record has been positive in luring talent from around the globe, although Ramakrishnan does not subscribe to the view that there is a particular type, predisposed to success in his field.

“Great scientists come in all sorts of varieties. Some are simply brilliant, some are very dedicated and patient and stubborn, some are maverick, some are very good at teamwork and are inspirational leaders, some are loners”, he adds. “Some people are real jerks, but they are great scientists and some people are amazingly inspirational role models. The common thing is that they have got to be really interested in a problem and willing to do whatever it takes to solve that problem.”

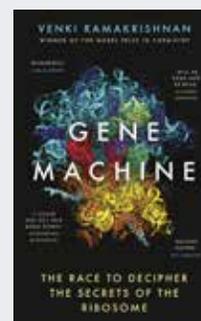
And he seeks to dispel another misconception, pointing out, “Nobel laureates can be great scientists, but they are not necessarily so. And there are many great scientists who have never won a Nobel Prize. A truly great scientist will be really driven to solve a problem and will be either smart enough to do it or savvy enough to get it done.”

One area where he does have a generally favourable view is the increasing tendency for academia and business to combine. It is a financial marriage that enables science to go beyond the levels it would achieve if relying on generating ideas and income simultaneously. It is also one in which Baillie Gifford participates keenly.

“It’s very good if you are transferring know-how. If you publish a paper, somebody in industry is not able to simply look at your paper and reproduce it. It requires a lot of know-how that can only be transferred personally”, he enthuses.

“Collaboration between industry and academia is probably a very good thing. That’s how you generate wealth. You are not going to generate wealth simply by a professor sitting in a university. On the other hand, you have to make sure that industry is not becoming the tail that is wagging the dog. It’s OK up to a point but industry can’t dictate the programme of a professor. If that’s the case, the professor should resign and go and work for the company. There is a delicate balance and it has to be decided based on transparency.”

It’s a typically forthright and honest opinion, in keeping with the content of a book brimming with those qualities.



Sir Venki Ramakrishnan is the author of *Gene Machine: The Race to Decipher the Secrets of the Ribosome*.

SAVING THE SYSTEM

Tom Coutts, a partner at Baillie Gifford hears Branko Milanovic offer a proposal for halting capitalist excesses. Tiffany Jenkins summarises the conversation.

“We are living in unprecedented times for capitalism: it is the only mode of production that exists.” That is the first meaning of *Capitalism, Alone*, the title of Branko Milanovic’s new book, which tells the story of the triumph of capitalism, the history of its various forms, and what can be done to improve it.

The use of Marxist terminology is deliberate. The Serbian-American Centennial Professor at the LSE, and one of the world’s leading economists of inequality confirms that “there is quite a lot of Marx in the book.”

After-all, Karl Marx, the co-author (along with Friedrich Engels) of *The Communist Manifesto*, “admired” some aspects of capitalism. But don’t worry, Milanovic reassures us, there is “quite a lot of Adam Smith too”. He even credits Margaret Thatcher and her ‘people’s capitalism’.

Casting his eye back over the centuries, Milanovic elaborates. In the latter part of the 19th century, at the peak of globalised capitalism, large parts of the world ran on unfree labour: “forced labour was only abolished in Hungary in 1848; in

Russia, in 1861; slavery in the United States in 1865; slavery in Brazil in 1888.” As capitalism cannot co-exist with unfree labour, it was not the only mode of production in those days. The following century, with the Russian Revolution of 1917, and the adoption of state socialism in Eastern Europe, and China, saw the rise of another competitor to capitalism. But since 1989, capitalism has become the only system, and, in Professor Milanovic’s eyes that includes China. Indeed, he divides modern capitalism into two versions: the ‘liberal’ one found in the West, and the hybrid that



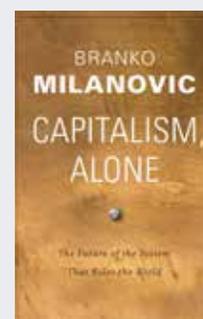
has emerged in China, which he calls ‘political capitalism’. “If you look at any objective indicator, China is a capitalist country.”

The comma in the title *Capitalism, Alone* is, he says, “supposed to bring about a pause”. That is intended to emphasise that capitalism’s very success also constitutes the greatest threat to its existence: there is no counterpart to put the system under pressure, or to keep it on a moderate path. This permits, Milanovic contends, “excesses and derailment”. Which is exactly what we are experiencing now: in the West, ‘liberal capitalism’ strains under increasing inequality (within nations) and immoral excess. That model is now being challenged by ‘political capitalism’, best exemplified by China, which, though often regarded as more efficient, is also more vulnerable to corruption and, when growth slows down, to social unrest.

After his analysis of that pregnant pause, a selection of recommendations follows. “If you believe as I do that further increase in taxation of current income is difficult politically, then

we are condemned to having higher and higher income inequality”. That is unless “we do something at the level of redistribution of capital”, by increasing “tax advantages for small investors”, “employee stock ownership”, and “not only managers but also workers getting shares in companies”. He is open to suggestions from the audience and the discussion touches on policy examples from Canada, Norway, Russia and Taiwan: a sovereign wealth fund, monetary policy, capital gains tax, even the distribution of free money. All these ideas, he says, have merit. “We need to create a society where assets are more equally distributed.”

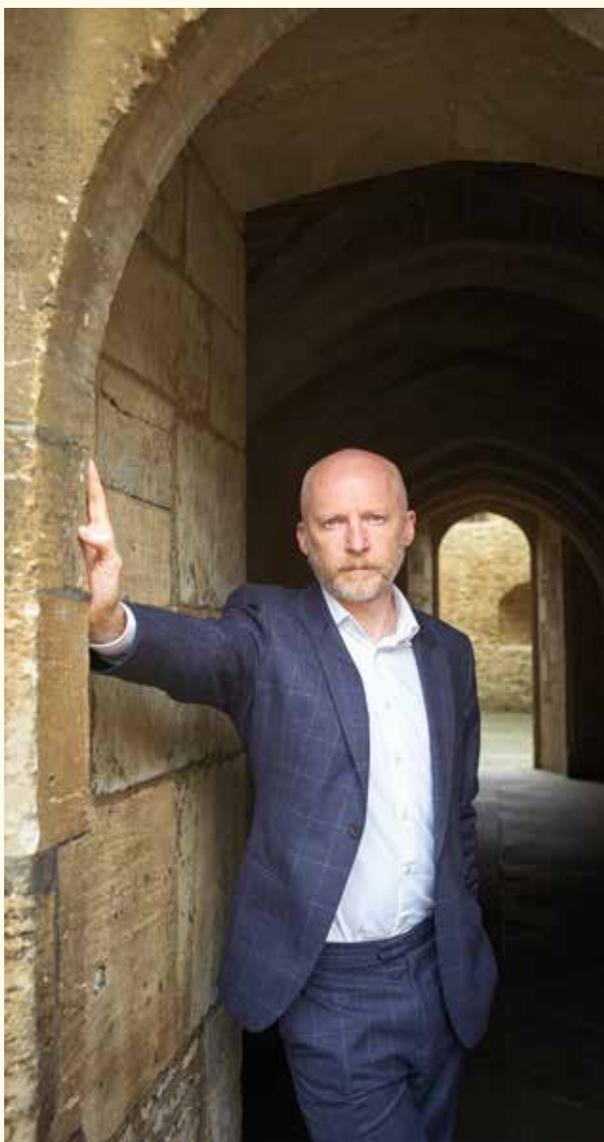
Milanovic is confident that policies to share income from capital more equally would actually work, and that we have the tools to implement them, but as yet policymakers lack the political will. That is where *Capitalism, Alone* comes in. His book is intended to apply the necessary pressure on the political class to address the weakness of the victorious capitalist system. For all its faults it is the best we’ve come up with thus far.



Capitalism, Alone is Branko Milanovic’s latest book.

INHUMAN INSTINCT

Marcus du Sautoy, Professor of Mathematics at the University of Oxford, in discussion with Tom Slater.



*Marcus du Sautoy, New College, Oxford
Photography by Julian Anderson.*

Tom Slater: Am I going to be replaced by a machine?

Marcus du Sautoy: The AI revolution is happening, and we are at a significant turning point. Everyone is comparing it to the Industrial Revolution but the effects of that were felt over two generations. This one is way faster. It's happening over 10 years.

Your field of investment is all about data, so it should be the perfect place for AI to make inroads. But while AI is often better than a human, the combination of human and AI is usually better than either.

I tried in my book to be optimistic about AI as a collaboration rather than as a threat to our jobs. The exciting thing is that in many industries, especially creative ones, this technology opens up amazing opportunities. It's not just something that will kill jobs.

TS: I guess your mathematical 'hunches' are based on recognising familiar patterns, as mine are in investment. Can machines distil such inklings into a kind of intuition?

MdS: In the past computing power was a matter of brute force: by analysing so many chess moves into the future of course it's going to have an edge. But that was top-down-style coding, when you know what you want to do, you code it up and you exploit the computer's depth of analysis.

Now we have bottom-up-style coding where you allow the code to 'learn' and adapt in the same way we do. Intuition comes from exposure to lots of different stories and seeing certain types of stories reappearing and others that are exceptional. Code is now enabling itself to pick out those patterns. And because a computer can work in 50 dimensions and not be fazed by variables, it can see connections that are hard for us, limited by biology to a three-dimensional world.

The challenge is that AI will now do things that look like mistakes, but which turn out to be winning moves. What happens in a sensitive field such as healthcare if it suggests, say, drug combinations that look crazy. Is it a mistake? Because an AI will make mistakes. That's how it learns.

TS: What we defined as human intelligence turned out to be things machines are better at: logic, chess or the game of go. Have we been wrong about what makes up human intelligence?

MdS: This is why I wrote the book. We know that driverless cars are going to happen and that robots will be able to pack our shopping. But we do think of creativity as something uniquely human.

But ultimately, even consciousness may not be something that is special to us as a species. It may be way down the line but I do think there will be a point when consciousness appears in a machine. The intriguing question is how much can you fast track the extraordinary thing that we produced as humans, our brain? That has taken millions of years of evolution, and in a way the AI revolution was about asking: 'Can we make this thing from scratch without that evolutionary process?'

How much will the AI, which is clearly extraordinary in the things it is able to learn, be limited because it hasn't gone through the same period of evolution our brains have? Obviously we can speed up its evolution, but can we speed it up to achieve 'consciousness'?

TS: Do you think our kids' generation will be better than us at resisting manipulation through targeting of data?

MdS: With knowledge of how our brains can be easily misled comes the power to recognise when it's happening to you. We are at a moment where technology is very powerful and those who know how to use it are gaining incredible power. That is why it's so important that we have as many people as possible explaining what is going on, so we don't become victims.



Ai-Da, humanoid AI robot artist.
© Nicky Johnston.

But I don't think we should be too down on AI. Any powerful new tool contains potential good and bad. We can't put this back in the box. What we need to do is make sure we understand what's going on. The sugar and tobacco industries suppressed evidence of unhealthy effects for many years. We need to make sure that any bad aspects of AI are not similarly covered up for commercial gain.

TS: AI-plus-human is best, say for spotting skin cancers. But if you are one of the 6 billion people who don't have access to a dermatologist, might AI on its own be a stopgap answer?

MdS: Yes, it has the potential to promote social inclusion. We have to make sure we don't find ourselves creating a two-tier system where there are people who have access to AI benefits and people who don't – that's why I think a 'data commons' of free shared data is an important component of what's required. We need to allow as many people as possible access to use this technology for the common good.



Professor Marcus du Sautoy is the author of *The Creativity Code: How AI is Learning to Write, Paint and Think*.

WHO WANTS TO LIVE FOREVER?

Sue Armstrong takes time out from her busy schedule to tell Heather Farmbrough about the ageing process.

I met Sue Armstrong, the author of *Borrowed Time, The Science of How and Why We Age*, in the Royal Botanic Garden in Edinburgh, in the memorial garden dedicated to Queen Elizabeth The Queen Mother. That lady knew a thing or two about ageing well.

But here's the thing – we are all getting older, all of the time, some of us faster than others, thanks to our cells. In *Borrowed Time*, Armstrong, a writer, science broadcaster and former foreign correspondent, tells a compelling story of the scientific discoveries and efforts to help prevent or delay some of the more serious aspects of ageing. In passing, she solves a few everyday mysteries such as why we forget words and why cuts take longer to heal as we get older.

What made her write this book, now? “This is a massive issue for policy makers, and the economy, and it is becoming more important,” she replies. “As soon as I tuned into the idea, I realised that I was hearing something about ageing almost every day. And it's almost always full of angst. People are asking, what are we going to do about the ageing population?”

“When you look at the statistics they are worrying. The fastest growing segment of the population is people over 85 years old – it's increasing five times as fast as those below the age of 65 – so the world's population is changing dramatically and all our care systems are overstretched.”

Her interest in ageing was also sparked by the fact that it happens to all of us. “Here's me, on the threshold of old age,” she says, “I'm aware that there are dramatic changes going on deep inside me, and I've always wanted to understand such things. Knowledge is power.

“It really hit me to discover that the biggest single risk factor for all those diseases we associate with old age, all those things we fear – dementia, heart trouble, stroke, osteoporosis, arthritis, cancer, diabetes – is quite simply the ageing process itself,” she continues. “If we recognise this, and we can understand how the process works, we can possibly intervene in the earlier stages to help prevent or delay the development of these distressing conditions. And yet neither the policy makers nor the NHS seem to have cottoned on to this.”

Armstrong is critical of the tendency to spend millions of pounds trying to understand individual pathologies and find therapies, while neglecting the root causes of these illnesses. While she dismisses miracle cures, she does as much as she can to stay healthy.

A slim, elegant 68-year-old, she keeps fit, walks as much as she can and sits down as little as possible, doesn't eat junk food and tries to eat early in the evening and to get as much sleep as possible, although doesn't always succeed with the last two.

Armstrong has been writing and broadcasting since 1980, her career encompassing the beginning of the AIDS epidemic, a subject which she wrote about and whose effects she saw at first hand, particularly over a decade living in South Africa during the collapse of apartheid. Her previous book published in 2014, *p53: The Gene that Cracked the Cancer Code*, described the work of scientists in identifying key factors in the chain of events that can lead to cancer when the tumour-suppressor gene p53 stops working properly.



This took Armstrong into the complex world of cellular senescence, which plays a particularly important role in ageing and in developing serious illness. Our cells are designed to divide in order to grow and repair our bodies. Dividing cells have a finite life; they don't die, but they senesce. Usually the immune system gets rid of them but as we age, our immune system becomes weaker, so dysfunctional senescent cells accumulate. These leach substances into our collagen fibres, causing wrinkles and the exterior signs of ageing, as well as problems at a deeper level.

How close are we to using some of the discoveries in Armstrong's book to develop effective treatments? Cell senescence, she answers, is a prime target for ameliorating ageing, and there is some very exciting science going on in this field.

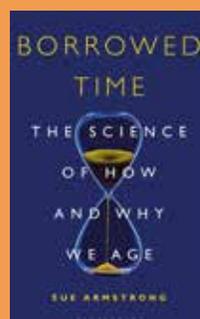
Indeed, Unity Biotechnology, in which Baillie Gifford invests, is developing therapies aimed at selectively eliminating senescent cells to stop, slow or reverse age-associated diseases and restore tissue to a more functionally healthy state.

However, as Armstrong warns, cellular biology is a delicate and complex science. "There is always a balance to be struck – many genes and their proteins have both Jekyll and Hyde roles. People like to think 'oh we have found the gene for such and such' but it is never as simple as that

because genes are switched on in some circumstances and not others, and can be switched on in the wrong place."

For instance, p53 has several roles. "Unlike in cars, where things don't talk to each other, in biology everything is talking to everything else and adjusts itself according to the messages it receives," she adds. "If you just pick out one thing, you upset the whole equilibrium."

Armstrong offers a clear and readable explanation of the ageing process, both in person and in print. With similarly little fuss, at the end of our interview, while everyone else departs by car or taxi, she announces that she has enough time to walk, and sets off at a brisk pace towards the Water of Leith.



Sue Armstrong's book is titled *Borrowed Time, The Science of How and Why We Age*.

RETAIL IS CHANGING, NOT DYING

Mark Pilkington, a retail expert and author, talks to Colin Renton.

Colin Renton: The demise of the High Street is attributed largely to the ‘Amazon effect’. Are there other factors?

Mark Pilkington: There are actually many factors that have brought us to where we are. You’ve had a situation since the industrial revolution whereby factories can produce at much lower cost than before. That’s what has given us the prosperity we all enjoy. But it has come with conditions. Firstly, it’s not very flexible. You had to maximise volumes of the product in order to get the economies of scale. And that created what’s called industrial logic to push products down the supply chain to consumers. To get the products to people you’ve got to have physical means of distribution, and that is essentially why you have stores. In the beginning, brands were manufacturers who stamped their brand name on products and started advertising and manufacturing heavily in order to create the level of confidence in the product. So, you end up with a supply chain whereby factories transfer or sell their products or brands to wholesale brands who sell to retailers. The retailer has the cost of a store and the cost of their sales forces within the stores.

What’s happened now is what you might call the technological revolution. It has changed a whole bunch of things. Firstly, it is changing manufacturing profoundly. You have the Internet of Things, robotics and artificial intelligence. You have the cloud and things like 3D digital printing which are transforming the way goods are produced. That is reducing the inflexibility, it is reducing the set up times and it is enabling products to be made in much smaller quantities. The system is potentially becoming a pull system rather than a push system.



The second big revolution is the ability of online companies to sidestep the storage stage of the distribution system and have much lower set up costs. The third element is the democratisation of information about a product. We all got smartphones and we got social media. Nowadays, you're not reliant on the brand or the retailer's advertising campaigns to learn about a product. You get your information from your peers, or from influencers, or from a host of other places. You have the makings of the ending of the supply chain as it has been for the last 200 years. I think this is a 40–50 year process.

CR What will city centres look like in 10 years or so?

MP If shops in some form are going to survive, they have to change from being goods distribution points to being more about entertainment. I think man is a social animal. I think there is still a need for meeting points. What we may see is a live entertainment-based form of retailing whereby there is more attention to entertaining and engaging the consumer with demonstrations on how to use the product, or to meet other people who are enthusiastic about the product, but not necessarily to pick up the product.

I think we'll see more pop-up type brands with something very new and very interesting and telling their story. Then they will move on and someone else will come in. The actual distribution job will be done through

the internet, but these will be places where they recruit customers.

CR Do you see a difference in the retail habits of younger people?

MP Absolutely. Younger people have a squeeze on their real income. They are unable to buy houses, they have student debts, they work in the gig economy so they have no pensions or job security. They are more frugal and they don't have much space because there are more children living with their parents than at any time since 1940. They are very environmentally conscious and very conscious of how goods are produced and where they are made, who is making them and in what conditions. It's harder to engage them and that's why some retail brands are collapsing. The brands that are engaging them have a completely different philosophy.

CR You say that governments need to take action to protect the retail environment. What should they do and why?

MP What we are talking about is a profound change in the way the supply chain operates and there's nothing governments can do about that. Nor should they. It's going to be a good change and in the end will be better for people, just as the industrial revolution was. Governments need to be aware of it and not put obstacles in its way. An example is that they are still applying the same monopolies

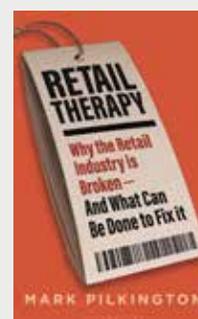
and mergers rules to struggling retailers who are desperately trying to consolidate. There is no market that is that monopolistic any more. It's all being disrupted by the internet players. If the retailers are not allowed to consolidate, the chances are that many will just go under.

The other aspect that's quite glaring is that the taxation system favours taxing things that are easy to tax. The physical retailers are easy targets because they are physically present while the internet players aren't. As a consequence, the internet players have been able to avoid most of the taxation, and it has produced a very unlevel playing field.

In the UK we've got the issues with rates and corporation tax where companies like Amazon pay virtually no corporation tax and virtually no rates because all they've got is a few distribution centres. Those are the sorts of things the government has to address very urgently.

CR Where do you think it's all going to end?

MP I think there will be far fewer shops. The retail presence that there is has got to up its game enormously and look at the interface between retail and entertainment. They need to have more music and more theatre, more art in the street if they want to attract people. It's therefore a case of the retailers and the governments working closer together.



Mark Pilkington is the author of *Retail Therapy: Why The Retail Industry Is Broken – And What Can Be Done To Fix It*.

NUCLEAR REACTION

Serhii Plokyh returns to the scene of his prize-winning book, Chernobyl, History of a Tragedy, with Malcolm Borthwick.



“These buildings are the tombstones of the dreams and lives that were lived here. It’s a huge cemetery of dreams, if not of people.” From the top of an old Soviet apartment block, Serhii Plokyh looks over Pripjat. “On the one hand it looks like a normal city, on the other hand you see windows without glass, streets without people and town squares taken over by forests.” Now the ghost town is used by the Ukrainian army for sniper practice and has also become a tourist attraction.

It’s a far cry from the Pripjat founded in 1970 to support the Soviet Union’s burgeoning nuclear industry. Then, the city had a population of 50,000 and supplied the construction workers and operators for the nearby Chernobyl

plant, which opened in 1977. “The nuclear power plant was a major technological innovation at the time,” says Plokyh. “It was the way to go for the entire world, a symbol of the future of humankind.”

Workers flocked to Pripjat from all over the Soviet Union. Ukraine was a sought-after place for Soviets to live and the government prioritised food (scarce at the time) and facilities for ‘nuclear cities’. Plokyh reels off a list: cheese and decent meat; theatre and literary clubs; at least two discos; and state-of-the-art sporting facilities.

But, at 1:23am on 26 April 1986, an explosion at the Chernobyl Unit Four plant changed everything for the

people of Pripjat and the entire world. The blast was due to a turbine test that went badly wrong. In his book, Plokyh describes how initially the authorities were in denial and blamed human error in their attempts to cover up the disaster. Through meticulous research of memoirs and KGB files he shows that, while mistakes were made, the roots of the disaster lay in the Soviet system. Specifically, the authoritarian character of the Communist Party and how it prioritised economic development over humanitarian and ecological concerns.

We stop for lunch at a canteen for the current workers in the Chernobyl exclusion zone, the 30 kilometre area around the nuclear plant that visitors need a permit to enter. Over a meal of vegetable soup, rice and pork, rounded off by pancakes with cottage cheese, Plokyh recalls his fears that the radiation would contaminate the water supply. Now Professor of History at Harvard University, back then he was 29 years old and living in Ukraine. “The city where I grew up is on the Dnieper. The Pripjat River, from which the city takes its name, flows into the Dnieper. Around 30 million people depend on this river for their water and there was a real concern that it would not be drinkable.” The information vacuum led to some unscientific solutions. His friends in Kiev acted on rumours that vodka could help fight radiation by holding drinking parties.

For years Plokyh’s emotions remained raw, which is why he needed time

to reflect before writing the book. “I felt I was ready. I wanted to do it a little bit earlier and I started but decided emotionally I couldn’t do it. The distance in time gives us a better scientific understanding of what happened and more perspective. Also, we have access to archives which we didn’t have in the 80s and 90s, including the KGB archives.”

There are heroes and villains in his book. The heroic efforts of the firefighters who were brought in to lift radioactive material from the roof of the reactor stand out. Many received fatal doses of radiation in their efforts to stop the fires spreading to the other reactors. It wasn’t just the firefighters: close to 600,000 people were drafted in from all over the Soviet Union to help limit the damage caused by the explosion and the emission of radiation. Without this help, the results could have been catastrophic. In a chilling reminder Plokhy says in his book: “If the other three reactors of the Chernobyl power plant had been damaged by the explosion of the first, then hardly any living and breathing organisms would have remained on the planet.”

As we pass by a Ferris wheel that was completed just two weeks before the explosion but never used, Plokhy says: “The authorities did the best they could. The big issue and the big problem was that they kept silent when it came to releasing information to the world and to their own people, even people here in Pripyat.” He paints the scene of the evacuation of Pripyat, a full day and a half after the explosion. “It was a weekend, the farmers’ market was working two hours before the evacuation, there were weddings in the city and children were playing in the sand. After the explosion the KGB took complete control of information between the city and the rest of the world. It was top secret.”

Later Perestroika, the political programme to accelerate openness in the USSR, helped lift the veil of secrecy. But Mikhail Gorbachev, the Soviet leader who implemented Perestroika, was slow to act. “Chernobyl wasn’t his finest hour, to put it mildly. He was very much part of the old Soviet thinking. It took him two weeks to address the nation in his first and last Chernobyl speech and almost three years to visit the plant,” Plokhy says. “We shouldn’t attribute all the blame to Gorbachev because he represented the system. Stalin only visited the front lines of the Second World War once. Soviet leaders were not supposed to go to dangerous places.”

Thirty-three years and billions of pounds later, Ukraine is still dealing with the radioactive fallout. We look at the giant concrete and metal arch, 110 metres high and weighing 36,000 tonnes, which seals off the radioactive ‘sarcophagus’. The structure is estimated to have cost

1.5 billion euros (£1.2 billion). “It doesn’t address the issue because we don’t know what reactions are happening within the fuel in the power plant,” says Plokhy. “The real way to deal with that is to get the fuel out but that would cost billions and billions more. The arch is covering the problem without solving the problem.” To put this in perspective, the half-life of the plutonium-239 which was released by the blast is 24,000 years. The challenge isn’t just financial. “They don’t know how to remove the fuel because people will die and the equipment doesn’t work in the reactor [the radiation is still too intense]. They are waiting for a genius,” he adds.

As we drive away from Chernobyl the conversation turns to nationalism. The blast had a profound impact on the Soviet Union. It became a rallying cry for the early opposition movement in Ukraine which mobilised around ecological issues.

“Ukraine’s vote for independence killed the Soviet Union. It was the second largest economy, the second largest republic. Maybe it would have happened later under different circumstances but you can’t remove Chernobyl from the story. That’s where the beginning is.”

We pass more deserted houses covered in snow and swamped by the forest of birch and pine trees. We stop and look at one of only two remaining statues of Lenin in Ukraine, both of which are in the Chernobyl exclusion zone (there were once over 5,000 statues of Lenin in Ukraine). It’s another reminder that the zone is frozen in a Soviet time warp.

Our guide brings out her radiation counter again and says that during our seven-hour visit to the zone we were exposed to less radiation than we would be on a normal two-hour plane journey. I’m not sure if this is reassuring or not as my thoughts turn to the flight home.



Serhii Plokhy won the 2018 Baillie Gifford Prize for Non-Fiction with his book, *Chernobyl, History of a Tragedy*.

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