

Climate for change

Andy Haldane and **Christiana**

Figueres discuss reasons for outrage –
and optimism – about the future

Eight young Fellows join an RSA
roundtable to talk environmental action

Dr Debbie Yaver reports from the front
lines of the food revolution



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The RSA (The Royal Society for the Encouragement of Arts, Manufactures and Commerce),
8 John Adam Street,
London WC2N 6EZ
Tel +44 (0)20 7930 5115

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Editor

Leah Clarkson

(editor@rsa.org.uk)

Creative Director

Ben Barrett

Editorial Manager

Mike Thatcher

Senior Designer

Hayden Russell

Production Manager

Jack Morgan

Distribution

Mark Jaeger

Agency Founder, Wardour

Martin MacConnell

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“Radical activism, like nature, is intrinsic to us as Fellows of the RSA”

“One touch of nature makes the whole world kin.” Never have Shakespeare’s words been more prescient; he recognised that nature is the world’s ultimate binding agent. It is not only something whose enjoyment is enhanced, not diminished, by the enjoyment of others but, more fundamentally, we are ourselves part of nature. Nature is us, our kith and our kin.

Yet, our actions towards nature over recent centuries have often been neither familial nor friendly. At best, we have treated it as extrinsic – something to be managed or cultivated. At worst, we have treated it as something to be extracted or mined. The results are now only too obvious, with the world on fire and natural capital hugely depleted in the space of just a few generations.

That makes turning this environmental tide the challenge of this century. At the RSA, our programme of change, Design for Life, is the recognition of that challenge – the regeneration of people, places and planet, in partnership and in harmony. This issue of the *Journal* devotes itself to discussing the issues, challenges and opportunities presented – and the radical activism needed – if this environmental regeneration is to be successful.

In this edition’s ‘In conversation’, we speak with Christiana Figueres, one of the most influential global leaders in the environmental movement and an architect of the 2015 Paris Agreement on climate change. She tells the story of how her experience of the extinction of the Costa Rican golden toad set off a chain of events ultimately culminating in success at COP21.

Subsequent COPs have not had the same success. But Figueres is a voice of optimism, believing the climate of opinion – if not yet

the climate itself – has recently shifted onto a different trajectory. The countries currently engaged in a global green arms race are evidence of this, as are the young Fellows working to fight against the climate crisis who recently convened at RSA House to discuss youth empowerment, what inspires them, and how they access and maintain hope. And this edition of the *Journal* contains many more examples of inspiring climate actions and actors, often operating locally and initiated by young people.

Figueres is far less optimistic about nature than climate. Biodiversity losses across our planet have been huge and are continuing. In comparison with climate, the nature debate remains inchoate and the accompanying actions, nationally and globally, embryonic. While some countries have successfully turned the tide – Costa Rica is one example with rapid tropical reforestation over recent decades – most have not even begun this journey.

Change needs to start in early years. The RSA’s ‘Playful green planet’ initiative for children in early years settings and primary schools puts nature centre-stage in refashioning education. And our ecosystems often show a remarkable capacity for resilience and regeneration. For every golden toad story there is a tardigrade story – an eight-legged creature with a Rasputinesque capacity for survival over 600 million years, as related in the article by Dame Jo da Silva.

Radical activism, like nature, is intrinsic to us as Fellows of the RSA. Through organisations like ours, working collaboratively and collectively, we can, as Gandhi said, “be the change we wish to see in the world”. When it comes to meeting the planetary challenges of the 21st century, I hope this issue of the *Journal* helps inspire us all to do just that. ■

Andy Haldane is
Chief Executive
Officer at the RSA

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We are the RSA

The Royal Society for the Encouragement of Arts, Manufactures and Commerce. Where world-leading ideas are turned into world-changing actions.

The RSA has been at the forefront of significant social impact for over 260 years. Our proven change process, rigorous research, innovative ideas platforms and unique global network of changemakers work together to enable people, places and the planet to flourish in harmony.

We invite you to be part of this change. Join our community. Together, we will unite people and ideas in collective action to create opportunities to regenerate our world.

Our mission

Enabling people, places and the planet to flourish in harmony.

Our vision

A world where everyone can fulfil their potential and contribute to more resilient, rebalanced and regenerative futures.

How we deliver our work

We unite people and ideas in collective action to create opportunities to regenerate our world.

We are

A unique global network of changemakers enabling people, places and the planet to flourish in harmony.

RSA



SDAs: unlocking the potential of student design

Winners of the 99th annual Student Design Awards (SDAs) were recognised in a ceremony in June conducted by RSA Chief Executive Andy Haldane and sustainability provocateur and award-winning designer Dr Leyla Acaroglu.

The SDAs are a global competition that challenges higher education students and recent graduates to apply their skills to tackling social and environmental issues. Andy described the SDAs as “not only the oldest but also the most influential design awards for young people in the world”.

Entries were assessed across nine design ‘briefs’, with winners including projects that: enable primary school children to develop community gardens at local railway stations; help the public to check their heart health through high-tech posters; and create sustainable floor tiles made from eggshell waste.

Speaking at the ceremony in the Great Room at RSA House, Andy said the SDAs were part of a broader RSA ambition to rethink education and lifelong learning. “How tragic is it that roughly half of all the young people leaving education right now do so loathing learning,” he said.

“If we are to change that, we need nothing short of a radical rethink and reformulation of how we go about educating and learning on a lifelong basis. That, at root, is what the SDAs are about – rethinking how to go about that, unlocking that potential, that creativity in everyone.”

■ See article on p. 34 for more on the history of the SDAs and future plans

■ To read about the SDA winners, visit thersa.org/student-design-awards/winners/2022-23

Action

Creative economy PEC team joins RSA

Key staff from the Creative Industries Policy and Evidence Centre (Creative PEC) have transferred to the RSA as part of a partnership to host the body that produces research and policy recommendations on the creative economy.

In March it was announced that the RSA and Newcastle University would become co-hosts of the Creative PEC based on a ‘twin hub’ structure. Staff who were based with the previous host – the National Endowment for Science, Technology and the Arts (Nesta) – have now transferred to the RSA.

“We are delighted to be co-hosting the Creative PEC at this hugely important time for the sector and the economy,” said Andy Haldane, RSA Chief Executive.

“By combining the very best analysis and research, with the RSA’s on-the-ground programme of work, we believe we can realise the enormous potential of the creative industries to grow jobs and skills, income and exports, health and happiness, in communities right across the UK.”

The Creative PEC is supported by the Arts and Humanities Research Council, which has confirmed £11m in funding for the next five years.

RSA Insights

3 hrs

How long it takes to travel the 130km separating two of the Core Cities (an alliance of 11 cities across the UK), Liverpool and Nottingham, by train. The longer train journey of 160km from London to Birmingham takes just 1hr 40m, highlighting the urgent need to improve connectivity among the cities and regions of the UK, not just their links to London.

■ To learn more, visit thersa.org/projects/uk-urban-futures-commission

5,600

The number of new homes that could be added, with support from a £255m innovation fund, in areas of high housing need across the UK. 102 million square feet of UK office space currently sits empty. An upcoming RSA report, 'Stuck in a rut', recommends that policymakers learn from similar initiatives in the Netherlands and retrofit offices into high-quality homes.

■ For further details, visit thersa.org/projects/health-economic-insecurity

Medal winners

Two high-profile figures in the fields of climate change and nature have been recognised as winners of the RSA's 2023 Albert and Bicentenary Medals.

Christiana Figueres, who was instrumental in bringing about the 2015 Paris Agreement, has been awarded the Albert Medal in recognition of her leadership and creativity in climate and nature action (see interview, pp10-15).

Satish Kumar and Schumacher College have been awarded the Bicentenary Medal. Kumar, an activist and speaker, is Co-Founder of the college, which is an ecology centre, and the medal recognises their outstanding contribution to ecological learning.

Arts in the spotlight

Gaia and the Globe

Gaia's Company and Shapeshifter Productions were awarded a grant from Arts Council England to produce *Gaia and the Globe*, a theatre, music and education project revealing the importance of the Gaia science worldview, which explains how the planet has maintained the conditions for life to survive and thrive for 3.6m years.

The centrepiece of the project is the interactive, improvisational musical performance *Gaia and the Globe*, which celebrates the social, cultural and personal implications of the Gaia worldview. It was created and directed by Peter Horton of Gaia's Company and developed over the course of a 10-day residential Research & Development project carried out at Exeter University in partnership with Global Systems Institute.

Image courtesy of Shapeshifter Productions



■ To learn more and find out how to support the project, visit www.shapeshifter-productions.com/gaia-and-the-globe/

Agenda

Percolating change at RSA Coffee House

The RSA has agreed to continue its partnership with Company of Cooks, part of CH&Co, in providing catering and hospitality services at RSA House for Fellows and commercial customers.

Significant investment has been made in the Coffee House, which has undergone a refresh over the summer. There is new décor, more ergonomic furniture, a better sound system on The Steps, and a healthier and more sustainable menu for Fellows and guests.

New technology in the form of the RSA app has been introduced to allow quick and efficient at-seat ordering. Social enterprise schemes have also been initiated such as Well Grounded, which helps people facing employment barriers to access work in the coffee industry.

Company of Cooks Operations



Director Ciaran Hogg, said, "We're delighted to continue working with an organisation and individuals whose values we not only embrace

but believe in and deliver wherever possible. We are so excited to offer great food, drinks and service in a positive and meaningful way."

Events

Fellows Festival 2023

Henry Dimbleby

The food campaigner and systems reformer, author of the School Food Plan and the National Food Strategy, casts his net beyond schools and beyond the UK to the whole globe, asking what will it take to get ourselves and our planet into shape?



Watch now:
bit.ly/3pV64Qn

Sir Partha Dasgupta

As we celebrate the 300th anniversary of the birth of Adam Smith, the economist and author of the Review of the Economics of Biodiversity invites us to rethink our idea of the 'wealth of nations' and to put nature at the heart of economic decision-making.



Watch now:
bit.ly/3DhRO7p

Rebecca Solnit

The prolific writer and long-time climate activist urges us to change the climate story from despair to hope. It's not too late to act; we know the world can be better and we can enter a new age of abundance if we get this transition right.



Watch now:
bit.ly/3O2GYY2

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Fellowship



Notice of the 269th RSA Annual General Meeting

Notice is hereby given that the 269th Annual General Meeting of the RSA will be held in The Great Room at RSA House, 8 John Adam Street, London WC2N 6EZ on Thursday, 19 October 2023, at 6pm. Communication on the agenda and information on voting has been circulated via email to Fellows.

■ For any queries, contact fellowship@rsa.org.uk

New Fellows

Samantha Holdsworth is Chief Executive Officer of Clowns Without Borders UK, which provides children with 'emotional first aid' through laughter and play. With its international network of professional artists, Clowns Without Borders creates the space, conditions and permission for children to reclaim what it means to be a child, building emotional and psychological resilience through trauma-informed approaches to play.

Social entrepreneur **Raju Kendre** hails from a nomadic tribal family; he founded Eklavya India Foundation in 2017 in order to promote higher education and leadership among first-generation learners in India, and currently serves as CEO. Through impactful career workshops and mentorship, Eklavya has facilitated admissions for over 1,200 students into renowned universities and fellowship programmes.

Some Fellowship events are online: to find out more and connect with Fellows in our global community, visit thersa.org/events/fellowship

Join our online community: chat, connect and collaborate with Fellows through Circle. To get started, just login through your My RSA account.

■ To find out more, visit thersa.org/fellowship/community-platform

Uli Lenart is the Assistant Manager of the pioneering independent community bookshop Gay's The Word, located in Bloomsbury, London. Established in 1979, Gay's The Word is the UK's oldest independent LGBT+ bookshop, a space long used for meetings and events. Uli also works as a book reviewer, literary journalist and author interviewer. He is dedicated to championing queer literature, community and culture, inclusion and equality.

Phnesha Marchette Jefferson is Founder and CEO of Total Force Support LLC, a management consulting firm that aims to change how the world thinks and interacts with its workforce by supporting diversity, equity, inclusion and accessibility initiatives in the workplace and empowering leaders to better navigate a constantly evolving workforce. She is also author of the 'Gabby and Gigi' children's book series.

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■ For additional assistance, email the Fellowship Services team at fellowship@rsa.org.uk or call +44 (0)207 451 6939



**“We wanted to draw
a narrative arc
from impossible
to possible”**

International leader on global climate change Christiana Figueres speaks to Andy Haldane about how outrage helps fuel her optimism for the future of our planet – and the significance of a little golden toad

Andy Haldane: *I want to start at the very beginning: how did you first become interested in issues of climate and sustainability?*

Christiana Figueres: I am not a trained natural scientist at all; I am a trained social scientist. I did both my undergrad and graduate degrees in anthropology because I wanted to understand how social change occurs, and I was an active anthropologist for the first few years of my professional life.

Before that, I was born into a political family and accompanied my parents on their political campaigns to every corner of my beautiful country, Costa Rica. One corner they took me to was a national park called Monteverde where we had a golden toad that did not exist anywhere else in the world. I was 11 or 12 and had never seen a more gorgeous living being. I just totally fell in love with nature. Then, when I became a mother, I thought it was my responsibility to instill in my daughters the same love of nature, and I wanted to take them back to Monteverde during the mating season of these toads – and they were gone. The entire species had become extinct, and I was absolutely appalled.

This was back in 1989. Scientists told me they believed that a rise in the temperature of the surface of the forest caused a fungal disease that killed the species. I thought, if I, in my 33 years, have witnessed the disappearance of one species in this tiny country, that must mean that many species are disappearing across the planet. I panicked, thinking there is no way that I am living up to my responsibility as a mother if I bequeath my daughters a diminished planet.

I started to learn more about what was happening and, before I knew it, I found myself in the basement of the UN building in New York, before the first ever climate change COP, working on behalf of my country to figure out how to design a COP process to implement the UN Climate Change Convention, which had been accepted and adopted by all the countries at Rio de Janeiro in 1992.

So, there I was – in the midst of climate change because of a little golden toad.

Haldane: *Back in 2015, you were one of the key movers in getting the landmark Paris Agreement passed. Can you give us your take on how that was achieved?*

Figueres: To explain the success of Paris you have to look back at the failure of Copenhagen [COP15] in 2009, which I call the most successful failure of the UN. It was universally recognised as a total multilateral failure of politics and of diplomacy. But it was very successful in the sense that, as I assumed the leadership [as Executive Secretary of the UN Framework Convention on Climate Change] in 2010, we were able to carry out an in-depth analysis of what had gone wrong in Copenhagen.

Collectively, the global mood on climate from December 2009 was disastrous. It was in the trash can. At my very first press conference in July 2010, a journalist asked if I thought that a global agreement would ever be possible. My immediate answer was, “Not in my lifetime.” You know how sometimes you say things because they come out of your gut and through your mouth without going through your head?

That’s what happened, and then when it got to my head, two things were immediately evident to me. Number one, I just gave voice to the global mood on climate change. Second, I was not living up to my maternal commitment to turn over an improved planet to future generations. So, I decided: “I am going to devote my time here to proving to myself that I was wrong in what I said and that a global agreement is possible.”

I injected time to re-energise, regenerate that team of brilliant people at the secretariat who had devoted their entire life to climate change. I also travelled to almost every country to understand what they were envisioning for their own sustainability and future prosperity.

After several years, quite unusually for a UN institution, I created something called the Groundswell – a covert operation that went beyond the countries that are Parties to the Convention, and beyond the traditional tasks of the secretariat. I confidentially convened an

Christiana

Figueres is winner of the RSA’s 2023 Albert Medal for her leadership and creativity in the areas of climate and nature action. As Executive Secretary of the UN Framework Convention on Climate Change, she was instrumental in bringing about the successful Paris Agreement of 2015. She is Co-Founder of Global Optimism and co-host of the *Outrage + Optimism* podcast

Andy Haldane

is Chief Executive Officer at the RSA

unusual team of people under the direction of Tom Rivett-Carnac and gave them a mandate to build a ‘surround-sound system’ to envelop all Parties, and even the secretariat, with a positive message on the possibility of reaching a global agreement.

We wanted to draw a narrative arc from impossible to possible. That was a two-year journey. We reached out to technology providers, scientists, religious communities, women’s groups, youth activists, indigenous leaders, doctors, subnational governments... to all stakeholders, and we created a surround-sound system of encouragement. Every time governments got weak knees, wherever they turned, they got positive reinforcement that, yes, this was going to be possible.

Haldane: *Groundswell was itself changing the climate of debate in pursuit of changing the climate. It’s a great case study in making change happen, especially globally. What were the other factors that ultimately made Paris a success?*

Figueres: First, one of the key factors of success was that, even back in 2015, we were seeing that the technologies that could contribute to the decarbonisation of the global economy, for example renewable energies and electric vehicles, were already coming down in price, increasing their efficiency and competitiveness in the market.

Second, the geopolitics were very important. President Obama was in his second term and thus more willing to risk some of his political cards on climate change. We also had a Chinese government that understood that decarbonising their production lines actually offered a competitive edge and which was therefore willing to stretch and reach out to the US.

Third, we had the rise of subnational governments, especially cities, but also states and provinces, as political players in a way we hadn’t seen before, because they saw that their citizens needed the protection and the benefit of decarbonising the economy.

Finally, we had spent several years looking at everything that had gone wrong in Copenhagen and how we could correct it. There is never a more valuable lesson than having failed at something, and we ended up with a 300-page ‘Bible’ of lessons that we could use to design the improvement of the entire process.

Haldane: *Let’s turn the clock forward to today. To put it charitably, the geopolitical stars are not in the same alignment now as then and progress against the targets has not been as we would wish. What is your sense of where we are now, both geopolitically and in terms of making good on the 2015 commitments?*

Figueres: I think you may overestimate the impact of the tragic status of geopolitics now. The very difficult relationship between the US and China, to begin with, or between Russia and the rest of the world, is certainly of huge concern. Geopolitics is definitely not with us at all.

At the same time, and without minimising the unforgivable pain and suffering that has been visited on the Ukrainian people, one of the unintended consequences of the Russian invasion is that the world has woken up to the perils of continuing to depend on fossil fuels. No nation wants to continue to depend on erratically priced, unpredictable imports of fossil fuels produced by irresponsible regimes. That has had a very interesting impact, with investment into renewables going completely through the roof.

Five years ago, we invested \$1tn into fossil fuels and the same into clean energy; it was shoulder to shoulder. This year, we are still investing \$1tn into fossil fuels, but we are investing \$1.7tn into clean energy. That means that we have turned a corner with energy.

I would argue that geopolitics is no longer as critical as it was back in 2015, because today the guidelines or guardrails for the decarbonisation of the economy have been set: read the Paris Agreement. Now it is the political economy that is pushing the transformation forward. We may be seeing a race to the top!

The positive characteristics of renewable energy are now so compelling that market forces are arguably more important than geopolitical forces. Market forces are already driving electricity generation from renewables, electrification of light vehicles, and right behind them we will see the electrification of heavy trucks, ships and even aviation. All of that will be decarbonised in spaces of time we would never have imagined 10 years ago. The energy sector is going exponential in its decarbonisation simply because it’s a better technology and offers energy independence.

Where we are definitely not going exponential is with nature. Everything to do with land ►

Artwork by
Peter Crowther
for the RSA. Peter
is an illustrator
who specialises in
photorealistic 3D
rendering



“No nation wants to continue to depend on erratically priced, unpredictable imports of fossil fuels produced by irresponsible regimes”

use, regenerative agriculture, with stopping deforestation, that whole sector is way behind. There is no compelling business model behind that yet. The narrative is still a moral obligation-based narrative that doesn't square with the market economy, sadly, because economists have still not internalised the externalities into everything that has to do with land use and with nature. As soon as they do, the risk-reward ratio will fundamentally change.

Haldane: *You said that nature is where the dynamic hasn't yet changed. But it's not a universally bleak story. I turn back to Costa Rica, which has been a green pioneer. What delivered it in Costa Rica and what can we learn from that experience?*

Figueres: Costa Rica's story is impressive, but it is unique, and it is the story of a country that realised very early that we had absolutely no value under the ground. We have no metals, no mineral resources, no precious stones, no fossil fuels, we have nothing to dig up or extract. All our resources are above ground. Our biodiversity is our richness, our wealth.

Since we don't have fossil fuels for electricity generation, we decided to use what we had, which was water. From the beginning our electrification in Costa Rica was with hydro. To that we later added geothermal because we also have several active volcanoes. We then added wind when wind energy became commercially available.

With respect to the land use sector, our agriculture is not one to model in front of any other country, with poor use of land for both cattle and agriculture. This is still a huge challenge for us. But where we are an impressive example is for what we have done on forest cover. Just 20 years ago we had 29% of the country under forest cover and today we have 52%. We are one of the very few countries that have not just halted deforestation but increased forest cover.

Why? Because it's in our economic interest to do so. We are an eco-tourist destination; tourism is our number-one income. People come to Costa Rica to enjoy our national parks. They come here because of our biodiversity. We understand that the more we protect our biodiversity, the more income we are going to have from tourists.

This is value and values. We can get on our moral high horse and say we are protecting our

land, but, honestly, it also just makes financial sense, and that's the way it should be. We should be able to make a business case for protecting, investing in and regenerating nature. It should not be only a morality issue. If it's not a compelling business case, it's just not going to happen. So again, here is my call to the economists of the world to fix that.

Haldane: *The economics profession is playing catch-up. But what are the avenues for helping us make the business case compelling? Economists like markets, and now there is an embryonic movement towards developing markets in nature. Is this a route to redemption for nature and making the business case?*

Figueres: I know this is a polarising topic, but I am very much of the school of thought that believes we must attach monetary value to that which we treasure. That means attaching a monetary value to the role of nature. I am an enthusiast for markets and have been a proponent of carbon markets in both the energy and the nature sector for years. I know that there are many countries that don't agree with that position, but I think the benefits outweigh the risks.

There is a case to be made for the timing and the urgency of the injection of capital into the restoration and regeneration of nature. The argument that we first must reach total decarbonisation in the energy sector before we turn our attention to nature is dangerous, because it would mean that we wouldn't turn to nature until 20 or 30 years from now. How much nature are we going to have left by then?

Haldane: *What's come across today is how much of an optimist you are as the person who set up the Global Optimism Group and through the *Outrage + Optimism* podcast. So, what are the grounds for optimism?*

Figueres: There are a lot. First, I derive optimism from our accomplishments. Let's recognise that we are already in a much better place today than we were in the past with respect to many social and economic issues such as infant mortality, women's rights, education in general (but especially for girls and women) and positions of power for women. There is

“We should be able to make a business case for protecting, investing in and regenerating nature. It should not only be a morality issue”

ample data to show that we have improved as a society. We have brought millions of people out of poverty.

Second, I take optimism from the present. What the young people are doing, the millions of people who are on the streets and calling us to account because they understand that this is about their life, is deeply moving to me and so inspiring. It is certainly the responsibility of my generation to change the trajectory of emissions, but it is fantastic that we’re being pressed by young people today.

Third, let’s look at what is possible in the future. The world can be so much better, because we have the capacity for cities that are not built out of cement, roads and bridges, but actually organically grown, where there is much more local production of fruits and vegetables, where there is water capture, where there is more greenery, where there are fewer cars, because we have better transport, shared transport, intelligent transport, where pavements have been transformed into gardens, where rooftops are gardens, where building walls capture solar energy.

The technologies are there for sustainable agriculture, to end famine. We produce enough food for everyone to eat, we just don’t distribute it efficiently. We can produce healthy food and distribute it correctly, produce it where it is more needed, as opposed to depending on long transport. We are just beginning to understand what the oceans can provide for us, starting with what can be done with seaweed. The fact that we have so many entrepreneurs investing today into those technologies of tomorrow is a deep well of optimism.

The future is incredibly promising. I take optimism from that. I hope that I will live long enough to see some of these amazing pilot projects become mainstream, because the future that we want and the future that we choose is so much better than the present that we have. ■



Left: *Tree Planting at Badminton*, painted by Anna Zinkeisen in 1958, shows Henry, 5th Duke of Beaufort, receiving the first RSA gold medal, for planting acorns on his estate

RSArchive

A July 1912 article in *RSA Journal* provided a retrospective of the Society’s efforts, from the mid-18th to the mid-19th centuries, to address the lack of timber across Britain.

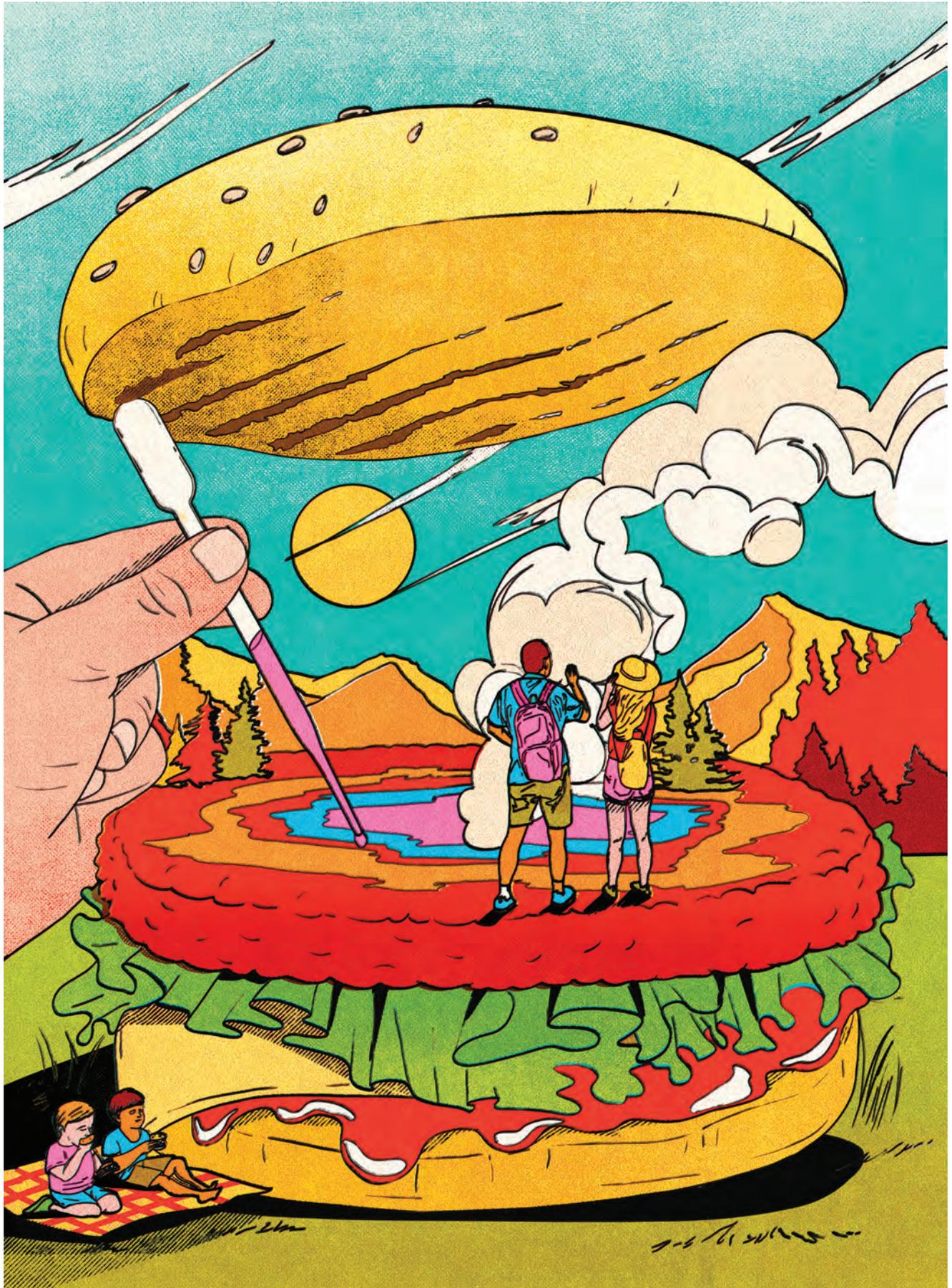
Written by the aptly named Henry Trueman Wood MA, Secretary of the Society, the article noted that, despite complaints extending back to the Restoration, no serious efforts to replace Britain’s timber stock were made until 1758, when the Society established gold and silver prizes for planting acorns. Prizes were again offered in 1759, with the addition of many more types of trees, including chestnut, pine, cedar, fir, larch, willow, ash, elm and walnut.

From 1758, when a gold medal was presented to the Duke of Beaufort for sowing 23 acres in Gloucestershire, to the final award in 1846, 127 gold medals and 40 silver medals were awarded. Among the notable awardees was Colonel Thomas Johnes of Cardiganshire, who planted over 2 million trees between 1795 and 1801 and received a total of six gold medals from the Society.

While the precise number of trees planted over the period is unknown, the lowest estimate was said to have “considerably exceeded” a staggering 50 million trees. The article characterised these efforts as “extremely successful”, with thousands of acres planted and the supply of timber largely renewed, stating that “many of the woods throughout the country” owed “their present existence to the initiative of the Society of Arts”.



■ To read the original article, visit bit.ly/3DQjDQ8



EASY AS FY

How one tiny microbe could change the way the world eats

by Debbie Yaver

Over the coming decades, feeding a world population nearing 10 billion in the face of climate change will require a truly global solution, and one that radically changes the status quo. Ensuring our growing population has access to safe, nutritious and sufficient food, specifically high-quality protein, is critical. So, the problem becomes one of managing our shrinking resources to feed our growing population – simply put, how can we do more with less?

Global food production faces numerous challenges that exact a heavy toll on the environment. One of the most pressing issues is the expansion of agricultural land. According to the Good Food Institute (GFI), right now animal agriculture occupies more than 75% of all agricultural land, and the majority of what is not used for animals is being used to feed those animals. This, despite the fact that animal agriculture only provides 17% of humans' global food supply. The need for land expansion often leads to deforestation, the destruction of valuable ecosystems, and diminishes the planet's ability to cope with climate change.

Intensive meat production is a major contributor to these environmental challenges. Raising livestock demands vast amounts of land, water and feed, leading to water pollution and greenhouse gas emissions. The extensive transportation networks required to distribute food globally add to the carbon footprint,

worsening the climate crisis. The world's population is projected to be almost 10 billion by 2050, and global demand for meat is set to nearly double. Addressing these challenges is essential to ensure a sustainable and resilient food system for future generations.

Creating a system to feed the world in a way that is nourishing for human health and nurturing for the health of the planet is an audacious goal, but it's one Nature's Fynd is prepared to meet with resilient optimism and Fy Protein™.

The story of Fy Protein begins millions of years ago in an acidic hot spring, located in what is today Yellowstone National Park, where a remarkable microbe was born. In 2009, one of our co-founders, Dr Mark Kozubal, was performing NASA-backed research on what life could look like if it existed in other parts of the universe. This led him to the park's hot springs, where he discovered and isolated our remarkable fungus, which he later named *Fusarium strain flavolapis*. It was found associated with a native alga (*Zygogonium*), minimal bacteria and no other fungi – a very simple community. With the lack of biodiversity, there are no surprises, as not many species can thrive in the extreme conditions in which *F. strain flavolapis* was discovered. Its native environment has high UV light due to its elevation, high ionic strength (the water contains a significant concentration of dissolved ions, such as sodium, chloride, magnesium and calcium), and is quite acidic. As ▶

Dr Debbie Yaver is Chief Scientific Officer at Nature's Fynd, a food company for optimists

a result, *F. strain flavolapis* is not a picky eater! It grows well on a range of feedstocks, from simple sugars to oils to algal biomass.

Fast-forward to 2012, when a chance encounter on a beach in Hawaii brought our Co-Founder and CEO Thomas Jonas and Mark together. Thomas was on a sabbatical after spending years as president of a major packaging manufacturing company; he wanted to do something that left the planet better than he found it. The meeting led Thomas to Mark's lab in Wyoming; Mark had initially considered using the organism to make biodiesel, but it became apparent that *F. strain flavolapis* was producing a high amount of protein. The surprising protein production, in conjunction with the organism's ability to grow in conditions that minimise contamination during commercial food production, inspired the pair to explore the potential in the food industry, and eventually a new start-up was born – Nature's Fynd, a food company for optimists.

Determined to do more with less, the scientists, explorers and optimists developed a technology known as liquid-air interface fermentation to grow Fy anywhere, anytime, with just a fraction of the natural resources of traditional proteins. This was a breakthrough in sustainable food production, and a significant leap forward in addressing the pressing issues of land scarcity, water scarcity and climate change.

Harnessing nature's power

The key innovation of liquid-air interface fermentation is that microorganisms grow at the interface between a liquid medium and air. This method harnesses the power of nature to grow Fy in a highly efficient and sustainable manner. The implications of this technology are vast. Fy can grow in tall growth chambers commonly associated with vertical farming. Compared with traditional protein sources, such as beef, research shows Fy Protein requires 99% less land and 99% less water and emits 94% fewer greenhouse gases at scale. Fy Protein can then be turned into almost any food imaginable, including meatless breakfast patties and dairy-free cream cheese, the company's first products available across the US.

In addition to its environmental advantages, Fy Protein's nutritional profile as a complete protein source means it has the potential to address global malnutrition and food security challenges. Fy is a complete vegan protein with

all 20 amino acids essential for human health. To create proteins, cells piece together a set of 20 different building blocks of amino acids, but human cells can only make 11 of these from scratch; people must get the other nine in their diets. Most animal proteins provide the right balance of amino acids, but vegetarians and vegans need to mix and match to get enough of the right amino acids. As a vegan source of complete protein, Fy comes with a naturally balanced ratio.

Fy is also a good source of fibre, including betaglucans and prebiotic fibre. Fy has 50% more protein per serving than tofu and twice as much as raw peas – and is a non-GMO (genetically modified organism) food, grown without the use of antibiotics, hormones or pesticides. It's also a significant source of carbohydrates and lends itself to a variety of applications ranging from dairy and meat analogues to flour substitutes in baked goods, making it a viable option for regions facing limited access to traditional protein sources. With its complete amino acid profile, Fy offers a high-quality protein source that can also help combat protein deficiencies in vulnerable populations.

Furthering the impact of liquid-air interface fermentation, we recently received a multiyear grant from the Bill & Melinda Gates Foundation to support research to develop a decentralised fermentation-based production method to benefit small farming households in low- and middle-income countries across Asia and Sub-Saharan Africa. This partnership demonstrates the potential of Nature's Fynd fermentation technology as a tool to improve livelihoods in economically disadvantaged regions. Decentralised fermentation is a promising solution that uses locally grown crops to develop novel protein sources within infrastructure constraints and through the involvement of local stakeholders.

Extraterrestrial cultivation

The transformational nature of liquid-air interface fermentation extends beyond its immediate applications on Earth. This technology also has the potential to revolutionise deep space travel by providing a sustainable and low-maintenance food source for astronauts on long-duration missions. By successfully growing Fy Protein in a microgravity environment during a collaborative project with NASA on the International Space Station, Nature's Fynd has opened up new

Artwork by
Maria Contreras
for the RSA.
Maria is an
illustrator born
and raised in
Chile. In 2022, she
won the Young
Guns award from
The One Club for
Creativity

possibilities for extraterrestrial cultivation and self-sufficiency in space exploration.

Nature's Fynd has over 55 patents covering a wide variety of technologies, including novel methods of microbial fermentation, production of mycelial (the vegetative part of fungi) mats, conversion of mycelial mats to foods and textiles, and production of cultured food products from filamentous fungi (such as vegan yogurt and cream cheese). These patents allow us to continue discovering the unique and life-changing capabilities of the liquid-air interface fermentation technology.

Nature's Fynd has also received over \$500m (£390m) in funding to date to fully scale our technology both on Earth and in space, raising a record amount of money for a food/beverage company in the Series C category of investment funding.

Aiming for delicious

The sustainability and nutritional value of Fy are important, but in order to make the impactful change we want to see in the world, the food made from Fy must also be delicious. Three-star Michelin chef Éric Ripert joined our team as a culinary adviser last year and, since then, Fy has been featured on the menu of his Le Bernardin New York restaurant as warm potato olive Fy parfait, Fy-filled squash blossom with blackberry sorbet cheesecake, apricot sorbet chamomile ice cream and, most recently, in a white and green asparagus with Fy béarnaise sauce. Like Nature's Fynd, Chef Ripert wants to leave a positive mark on our food system, so he also collaborated with us to launch a limited release of three vegan Fy dressings – they sold out in just six hours.

Revolutionary potential

The advent of liquid-air interface fermentation and the revolutionary Fy Protein marks a monumental leap in the realm of sustainable food production. Fy's unparalleled resource efficiency, coupled with an exceptional nutritional profile and minimal environmental impact, make it a game-changer in the quest for a sustainable future. Imagine a future where protein can be cultivated in regions previously deemed unsuitable for agriculture, thereby reducing pressure on ecologically sensitive areas. The versatility and adaptability of Fy enables us to envision sustainable solutions to food insecurity and malnutrition, especially in vulnerable communities facing environmental challenges.



“Fungi have never been as popular (or as heavily funded) as they have been in the last few years”

Fy production doesn't have to be restricted to historically inhospitable environments; we have proven that we can grow Fy in the middle of America's third largest city, at our headquarters in Chicago, Illinois. The ability to grow protein in densely populated urban environments has the potential to reduce greenhouse gas emissions and energy consumption typically incurred in long-distance shipping.

We see Fy as a platform technology with potential impact even outside of the food sector. Browse the patent outputs of filamentous fungal applications and you'll find a wide range of surprising applications – disease biosensors, building materials, leather alternatives, wastewater treatment. Fungi have never been as popular (or as heavily funded) as they have been in the last few years. The more our work and the work of other mycoprotein-based companies can inspire others, the better for all. Continuing to isolate organisms that thrive in different environments will only expand the toolbox we have to address the massive challenges we are facing.

Fy holds significant potential for long-term advancements in space exploration and socioeconomic development. Embracing Fy Protein could revolutionise the way we produce, consume and think about protein, fostering a brighter and more sustainable future for all. ■

DO THE RIGHT THING

Optimism and hope were the watchwords as the RSA hosted our annual Fellows Festival

by Mike Thatcher



Escaping the June heat, Fellows and guests crowded into the Great Room, the Durham Street Auditorium (DSA) and across RSA House for a day of inspirational talks and discussions. The theme for this year's Fellows Festival was 'What could go right?'

Prominent speakers from academia, business, civil society, government, arts and culture joined Chief Executive Andy Haldane and host Julia

George on stage to celebrate the most optimistic and imaginative new thinking for the future of people, place and planet.

Twenty-one-year-old Mya-Rose Craig, one of the RSA's youngest Fellows, opened the day. Craig is an author, environmentalist and activist who sometimes goes by the name 'Birdgirl'.

"In a world where things can feel dire sometimes, having hope is incredibly radical, so I really stick with that," she said.



What gave Craig hope, she suggested, was the passion of people, particularly young people, dedicating themselves to make the planet a better place.

“We have this younger generation who are working towards something better. When I look to the future, that is what makes me feel hopeful.”

Creative potential

The power of optimism was also emphasised in a speech from Culture Secretary Lucy Frazer. She highlighted the potential of the creative industries, which already account for one in 14 jobs in the UK, to boost growth and employment further.

It is hoped that an injection of £77m of new funding, announced recently by the government, could lead to a £50bn expansion in the creative industries and support a million more jobs by 2030.

“Working with industry, it is in our gift as a government to create the conditions where our creative industries thrive for generations to come. Conditions where careers in the arts are not just accessible to a privileged few but are a mainstay of local economies all across the country,” she said.

Frazer added that ‘levelling up’ was central to the government’s investment plans. “What we are also doing is funding creative clusters to stimulate that local growth, provide opportunities for creative education and to train people in creative careers.”

Assaulting nature

When it comes to the intersection of the economy, creativity and the environment, there are no bigger figures than Professor Sir Partha Dasgupta of Cambridge University, the author in 2021 of an independent review for the Treasury into the economics of biodiversity.

The review recommended that countries should move away from Gross Domestic Product (GDP) as a measure of economic wellbeing. Dasgupta told the festival audience that it

was “deadly wrong” to use GDP to assess the medium- or long-term progress of an economy because it does not consider the depreciation of assets, especially natural ones.

Dasgupta prefers a measurement of ‘inclusive wealth’ that counts nature-based ecosystems as capital assets, noting some progress had been made here. “Our statistical office, like many other countries – Chile, China, Japan, Australia – is now adopting satellite accounts of the state of the natural environment or natural capital.”

However, Dasgupta also described the annual \$5-7tn of global subsidy for the various businesses that use natural resources as a “mandate for assaulting nature”.

He was particularly concerned about attitudes to the oceans. Dasgupta’s proposal for an international body to monitor use of the oceans and introduce taxation had not been taken forward. “I have had many conversations – the world doesn’t have an appetite,” he said.

Natural optimism

Food standards campaigner Henry Dimbleby, who described Dasgupta as the “cleverest man I have ever hugged”, said he agreed that an alternative to GDP was needed. He suggested that subsidies to intensive agriculture, fishing and energy companies mean that we are “paying people to destroy nature”.

Dimbleby added: “The good news is that you can stop paying people and give [nature] a value. I am actually much more optimistic on our ability to bring nature back from the horrifically low levels that it is at than I am on the health side.”

Concerns about our impact on the world around us persist. But conversations at the festival in between the sessions in the Great Room and the DSA showed that optimism was just as infectious.

As Mya-Rose Craig noted: “When you meet so many people who care so deeply and are trying so hard, you can’t help but think to yourself ‘how could we not succeed?’” ■

“Having hope is incredibly radical, so I really stick with that”

Mya-Rose Craig
FRSA, author,
environmentalist
and activist,
pictured second
from left on screen

Mike Thatcher is
Editorial Manager
at the RSA

A SEAT AT THE TABLE

How has the environmental movement changed over the last generation? What motivates people to get involved? What strategies are needed to create change? Eight Fellows, all aged under 35, recently joined a roundtable, chaired by the RSA's Senior Fellowship Development Manager, Kirby Fullerton, to talk it out

Kirby Fullerton: *What compelled you to get involved in taking action against the climate crisis?*

Yemi: I was born in northern Nigeria, and moved to the UK when I was six. Every other year, we'd go back to reconnect with family who are from the south originally. Every time, we'd stop off in the north, and there would probably be a drought. Then we'd go to the south and it would be flooded. That made me realise that there's a lot of 'environmental impunity' – the exercise and abuse of power without accountability by governments. For example, the US withdrawal from the Paris Agreement or the UK scrapping its environmental aid investment targets disproportionately impacts developing countries.

Dominique: What sparked my journey was the impact of air pollution on where I was living in South London. I spoke to people in my area, including parents who were very worried about their children breathing in toxic air. I saw

that many environmental issues are linked to social issues. I learnt about how minorities are disproportionately impacted. I am Jamaican and American, as well as British, and on my visits to Jamaica I learnt about the impact of rising sea levels. I strongly felt the injustice that was placed upon those who had done the least to cause the climate crisis but were suffering the most.

Nathan: My work as an expedition doctor has taken me to some remote communities around the world. In my mid-20s, I saw first-hand some of the effects of climate change: entire villages that had been displaced from their homes due to melting glaciers, which they relied upon for farming, and the sheer scale of plastic pollution. I felt driven to use my position as a doctor to take action. As the World Health Organization put it, climate change is the single biggest health threat facing humanity. And yet, it didn't feel like people were treating it as a crisis – I mean, look how we responded to COVID-19. ▶





Attendees



Kirby Fullerton
RSA Senior
Fellowship
Development
Manager



Yemi Adeola
Social intrapreneur
and RSA Board
member



Lucien Georgeson
Policy analyst
and researcher



Nathan Hudson-Peacock
Expedition doctor
and Founder of
Eco Medics



Wilson Oryema
Artist, writer and
researcher



Dominique Palmer
Climate activist,
speaker and writer



Anna van der Togt
Lead Service
Designer,
Livework Studio



Laurence Watson
Co-Founder and
Chief Product
and Technology
Officer, Furbnow



Ben Weaver-Hincks
Producer, creative
consultant,
researcher and
writer

Kirby: *It seems that, for a lot of people, the catalyst for action is that lived experience of extreme climate change as real, not as something far away or abstract that can be ignored.*

Anna: I have a product design engineering background and, during my master's, I saw a documentary about how a couple of manufacturers had decided, "let's make our light bulbs in a way that they will break because otherwise we will stop selling them". I asked myself, "Am I going to be one of those who design for obsolescence?"

Initially, I focused on designing products with less environmental impact. But I soon discovered that's not enough, it's about having fewer products in the first place. And the products that are there should be designed to be shared, repaired, circular or even regenerative. Our entire economy, its legal structures, are completely optimised for linearity. Trying to make them circular is a vast and wicked problem. I get excited by a challenge like that. Luckily, excitement is a potent motivator for change.

Lucien: I also had a 'light bulb moment' that actually involved light bulbs! Straight after university, I was working for a retail business in London. One slow day, I was just counting the number of 100-watt halogen light bulbs that were on all day. Some are on all night. What an immense waste of resources. I thought there must be a life out there that involves trying to solve these problems. We're at the stage where it's about trying to work out what your skill is, what you're good at, and how that can be part of the solution.

Kirby: *Earlier this year Extinction Rebellion (XR) announced that it was prioritising attendance over arrest and relationships over roadblocks. What does that shift signal?*

Yemi: Direct action was drawing attention to a really important problem, but it was also leading to political polarisation. If you look at the news, they focus on actions rather than the underlying issue. XR's shift to relationship-building was around trying to broaden the mass appeal of environmental issues, to people who may not necessarily want to engage in civil disobedience or potentially get arrested, which – especially if you're a minority – can have serious implications.

Ben: There are loads of purposes of protest; it might be to put something at the top of the news agenda, it might be to build community, it might be to create a scene, or to get out some anger, to process sadness and grief. I don't want to play into a media narrative that this isn't getting mainstream support and therefore it's not productive, because there are lots of ways to be productive.

Wilson: Any human society over an extended amount of time tries to improve living outcomes and will always come up against risks and hurdles. People centuries ago faced different hurdles that felt existential. But, typically, we overestimate what we can do in a year and underestimate what we can do in 10 years. That type of thinking fosters helplessness and is one of the things that underpinned why people felt the urge to protest. They may feel it is the only thing they can do and may not have faith in the possibilities of technology to deliver change.

Nathan: Civil disobedience and protest are sometimes necessary and do generate media attention. However, partly thanks to social media, there's often a polarisation of views and there are a lot of people who support tackling the climate crisis who also feel that civil disobedience isn't for them. Perhaps XR realised this gap, and that meaningful change relies on having a big community and a mass movement. This doesn't mean direct action is going to stop altogether but, for XR, it's about welcoming a broader number of people into the movement.

Laurence: I'd add two things. One, it's incredibly useful to have people at the vanguard saying the world is on fire. It's not going to convince everyone, but it is going to make someone say "we need an action" and that's extremely valuable. I am hugely respectful of the people who take direct action today. In some ways, what they're doing is incredibly rational and, in 100 years, we'll look back and ask why weren't we all protesting?

Second, there are vested interests in the form of huge corporations, companies or states. We know about the lobbying effort and billions spent over the years, and all the cover-ups about climate. Those organisations are fighting as hard as they can to suppress these [environmental] movements. It's helpful to have that mindset from civil society that says we need to be aggressive

about calling out things. If we just say, "well, if only we get enough community action", then we're always going to be outmanoeuvred.

Lucien: There has never been the level of interest in the policy arena, or within companies on taking action on climate as there is today. That is partly because of this kind of coalition; there was a huge amount of public protest and action from groups like XR in the lead-up to COP26. There was also support from the government at the time. They wanted to make progress at those negotiations because they wanted the UK to be seen as a leader. They worked with businesses and the finance sector, to get them to make commitments.

Now, we're in a different phase, where we need to *do* things and that's where coalition-building and common agreement help to find where these different issues touch each other. While these big companies are in some ways part of the problem, they're made up of individuals, many of whom are trying to do things differently.

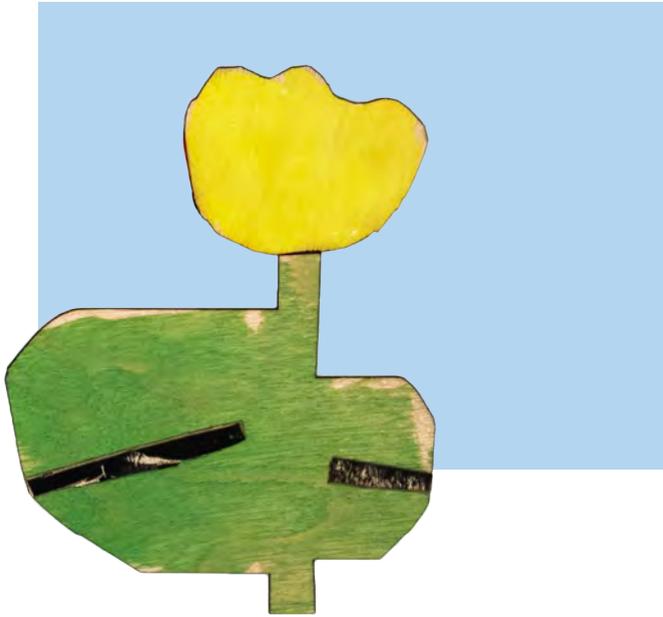
Kirby: *A lot of people, particularly young people, are facing feelings of intense depression around the future. What keeps you optimistic?*

Anna: Some of my friends decided against having children due to their climate concerns. ▶

“We overestimate what we can do in a year and underestimate what we can do in 10 years”

Wilson Oryema





“I wouldn’t be doing what I do now if I didn’t have hope that we can avert the worst of the climate crisis”

Dominique Palmer

That made me philosophise about my sphere of control, influence and concern. I realised my sphere of concern had grown much larger than my spheres of influence and control, making me stressed. I started to play around with my sphere of concern — extending or shrinking it. It turned out that stretching it too far (think, far into the universe) made me care less. The big issues of the world only matter because we know and feel they are tied to the ‘small’. We know they impact our own lives, our friends, family or neighbourhood. That makes the ‘small’ more important, like an anchor for the big.

Yemi: How many people get up every morning thinking, how can I change the world? Most people either can’t do that or don’t do that. So the opportunity to be able to make change is a gift. I stay optimistic by imagining what success looks like. To me that would be a sustainable, healthy environment – a world where our kids are breathing fresh air, where we work together to make sure that biodiversity is protected and enhanced.

Dominique: I wouldn’t be doing what I do now if I didn’t have hope that we can avert the worst of the climate crisis. Otherwise, I

wouldn’t be an activist. That hope does really come from speaking to people and engaging with communities who are doing so much, using so much power and energy into really shifting things. This is a rational response to what’s going on and so, instead of trying to individualise solutions, I focus on collective energy and community, and how I can be part of creating change.

Kirby: *What key action or change in your area of expertise do you think will make the biggest impact?*

Nathan: One of my aims is to create a mindset within the healthcare community that climate change is a global health crisis and social justice catastrophe, and not a purely environmental issue. As such, I believe that we healthcare professionals have a moral and professional duty to take action. I am also interested in sustainable healthcare and would love to see NHS hospitals shift towards a predominantly whole food, plant-based diet. This would have countless health benefits and has the potential to create a significant butterfly effect.

Laurence: In our work, we are trying to tackle the 14% of UK emissions that come from heating people’s homes. We want to make it easier for people who have the means to invest in their property and reduce energy demand. But there’s a lot that government could do even for free. Today, if you get a heat pump installed, it will probably make energy performance certificates go backwards, due to the design. That’s extremely unhelpful. There are targets around bringing up the standard of homes for private landlords, but there’s no target or regulatory pressure for homeowners. We need to be retrofitting millions of homes a year.

Ben: We are telling the wrong stories, or often not telling the best stories about this subject. I reject both dystopian and utopian visions of the future. For me, when we look at 2050, we don’t want to live in a world that is the same in every way. When we’re at net zero, what else can we challenge ourselves to do? Also, there are so many people who want to start integrating climate work and activism into their careers. But, in the context of economic, job and housing insecurity, how can we build sustainable careers, both for ourselves and for the planet?

Lucien: When it comes to corporate climate action, or carbon credits and markets, we need common agreements about what good looks like. Nobody is out there trying to do the wrong thing, but they need to have a very clear picture of what good looks like, and how they measure and report progress. That would unlock a lot of interest in taking action, but there is hesitancy around doing the wrong thing.

Yemi: An important piece is to build on the momentum provided by the Greater London Authority, the Welsh government and the UK parliament all declaring climate emergencies. There's political space to formulate policies that can achieve cross-party consensus.

There has also never been a better time to engage the private sector in environmental sustainability. In the last three to five years, shareholders have been voting with their money, and not investing in companies that are ploughing their money into fossil fuels. That provides a clear opportunity to work in coalition with the private sector.

Anna: As Lucien said, these corporations are made of people. Even though some of these claims or net-zero pledges may be close to greenwashing, they provide people that work in those organisations an excuse to bring their personal passion into their workplace. I invite people to talk about this at work. This transition goes across all professions and should be incorporated into everything.

Wilson: It looks like we're heading towards a future where fewer people will be required to work. What does that look like? How do you adjust education to be mindful of that? How does that play into the way that humans live? And what type of impact does that have on the world around them?

Dominique: First, we need to engage more people but, more importantly, empower those who have skills and experiences to be part of it. Second, we need to shake up philanthropy; get resources and capacity-building out to young people so they don't end up burning out. Third, we need to stop the Rosebank oil and gas field. It is the biggest proposed oil and gas field in the North Sea and would release the CO₂ emissions of more than the combined annual CO₂ emissions of all 28 low-income countries in the world.

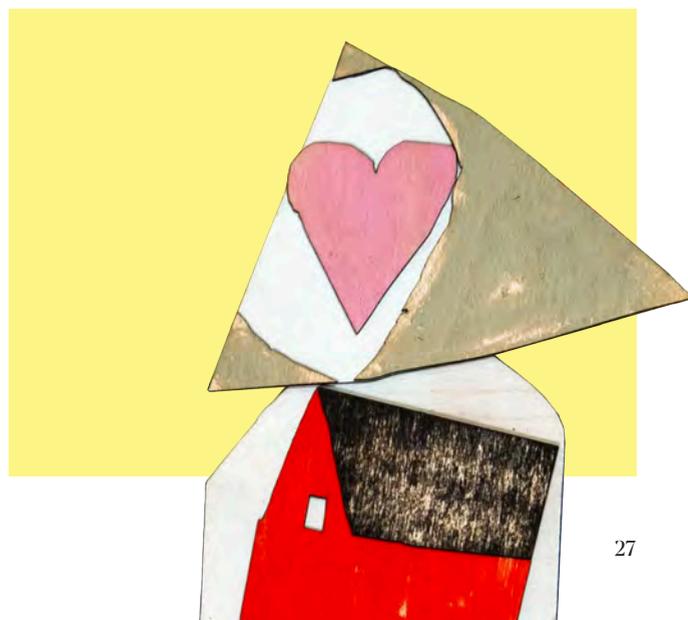
Kirby: *The RSA has a regenerative mission but what do you think, as young Fellows, the RSA's role could be in addressing climate change?*

Yemi: A big reason why I joined the Fellowship Council, and the Board, was because I felt that the RSA, like many large organisations, has a lot of resources that it doesn't put where needed. The RSA Catalyst Grant Committee allocates around £100,000 annually to Fellows' social impact projects. I worked with a team of financial counsellors to try to increase funding of Fellows' projects linked to the environment. The environment is intrinsic to all of the other issues that the RSA is involved in because it impacts future generations.

Nathan: Many organisations refrain from doing the right thing, because they're scared of how it might impact on shareholders, trustees and public perception. A simple example is that we've got meat and fish sandwiches here today, when all the evidence suggests we should be moving towards a plant-based diet. I'd love to hear the RSA be bold and say, "let's just make this all plant-based, let's make a statement".

Targets, goals and data are vital, but every day we delay, more people start to suffer. There is so much complexity and nuance in the climate debate, but when you bring it back to compassion, a lot of the time the right path becomes obvious. I'd like to see more conversation on that within the RSA, and for it to become a trailblazer, leading others down the right path as we navigate the climate crisis. ■

Artwork by **Nicolas Burrows** for the RSA. Nicolas is a visual artist who uses collage-based processes; he is also a Director of *Nous Vous* — a group of artists working together since 2007 on graphic design, illustration, publishing, performance and educational projects



GOOD STEWARDS

How can we see the forest for the trees when it comes to nurturing regenerative business?

by Andy Thornton

As businesses continue the much-needed shift towards valuing a more diverse range of capitals beyond the exclusivity of financial profit, we also need to consider the qualities and characteristics this will demand of those expected to navigate this complex transition.

With traditional 20th-century management models coming under increasing scrutiny, as much for the values they don't espouse as those they do, a more humane and adaptable form of regenerative leadership will be required. What would it mean to lead more authentically in this moment of change?

Our regenerative business coalition is convening soon, seeking to answer exactly this and similar provocations: what maturity of value, and values, should a more adaptive enterprise be striving for in such a future? What if everyone at work was empowered as an innovator, delivering outcomes and impact towards a thriving future?

We believe workforce capabilities will be critical for any meaningful transformation. Softer skills and attitudinal characteristics, such as flexibility, self-awareness, collaboration and empathy, are increasingly in demand, while role-specific skills tend to be more rigid and perishable by comparison.

This is because in our uncertain, yet more purposeful, times, the question inevitably becomes: which deep-seated values, mindsets and worldviews do we lean on to help us decide what course of action to take, especially when there is no established playbook to guide us?

The forest ecosystem as metaphor

Imagine the ecosystem of a forest. From the tree canopy above, to the foraging wildlife throughout the understory and, finally, the mycelial fabric of fungi hidden from sight below ground, all elements work in harmony to intuitively maintain a healthy whole.

We need leaders who recognise and appreciate the diverse and complex needs of their respective context. Seeking self-interested, extractive profit at the expense of other forms of broader prosperity across the wider terrain cannot be sustained without cost. Void of the right balance, landscapes become stagnant monocultures over time, particularly those touched by unsophisticated human intervention. Tree plantations change the very soil, flora and fauna of their environment. A similar clumsiness exists in our incumbent status quo of GDP growth at any cost.

Plantations of fast-growing, and rapidly cut, timber can curtail the rich potential of an emergent habitat that is encouraged to flourish over longer lifespans. Courageous leadership will demand patience and dedication to think in longer time horizons than the typical quarterly reporting cycle or five-year plan. Instead, we must act in accordance with what is vital to leave behind as ancestral inheritance for future generations. Ideally, a legacy that is more abundant than the one our current children will inherit from us.

Finally, a systems-level understanding of harmony requires mutual appreciation, awareness and cooperation. To acknowledge



that together we are greater than the sum of our parts. The ‘dog-eat-dog’ and ‘rat-race’ paradigms of recent history are far from appropriate metaphors to describe how nature imprints her patterning essence onto all life – where abundance flourishes not through predatory domination but interdependence. Collaborative advantage trumps competitive advantage every time.

Stewarding the new economy

Responding to such impetus, progressive business leaders are already looking beyond their silos to unite. Coming together across sectors to shape this new regenerative economy is no easy task. Too many established woodland giants can cast a dominant shadow from the canopy, stifling the light needed to nurture new saplings. Similarly, the understory of a virgin forest is stunted by the incessant pruning of grazing wildlife. Such metaphors are informative of the need for careful curation and custodianship.

“Courageous leadership will demand patience and dedication to think in longer time horizons than the typical quarterly reporting cycle”

As a membership organisation of 30,000 global Fellows, with diverse perspectives and deep experience on these topics, the RSA is well-equipped to support such an ecological revolution. Our role, with its 260+-year history of bringing together the best and brightest minds the arts, manufactures and commerce have to offer, will be to coppice such woodlands.

Stewarding the space that lets the light in, so the nascent understory can thrive. ■

■ *To find out more, visit [thersa.org/projects/regenerative-business-enquiry](https://www.thersa.org/projects/regenerative-business-enquiry)*



Artwork by Wardour

SEAWEED REVOLUTION

Marine flora can help to reduce world hunger, pollution, the impact of climate change, disease, biodiversity loss and social inequality. What would the world look like if we fully exploited its potential?

by Vincent Doumeizel

Seaweed, undoubtedly the world's greatest untapped resource, has been largely spurned by our society. Often misunderstood and seen as a form of pollution, the climate emergency and global population growth are now pushing us to reconsider this overlooked treasure.

The fact is that these species of marine algae offer an endless source of innovation and concrete solutions that could help us address some of the major challenges facing our generation. If we learn how to grow it sustainably, seaweed could feed people, replace plastic, decarbonise the economy, cool the atmosphere, clean up the oceans, rebuild marine ecosystems and reduce social injustice.

An essential pillar of life on earth, seaweed reproduces quickly and can grow dozens of metres in a few days without needing food, fresh water or pesticides. If we want to rebuild ecosystems instead of destroying them, seaweed is an excellent place to start.

Turning hope into reality

I was invited onto a radio programme recently and the journalist asked the speakers to sum up seaweed in one word. The oceanographer sitting next to me thought for a moment, and then chose a simple word: 'hope'.

To what extent can seaweed represent a new hope for the world of tomorrow? Each of us holds part of the answer. It is our joint

responsibility to turn hope into reality. To dream of a world where the economy's only aim is to repair ecosystems and improve social justice is perhaps utopian but, throughout history, the 'utopians' have made many advances that seemed far-fetched to their contemporaries.

Over the past 70 years, utopians developed food systems that have dramatically reduced the number of people dying of hunger. Utopians have also fought to achieve higher literacy rates, gender equality, greater tolerance of minorities, the establishment of democratic regimes in half of the world's countries and a historic reduction in the number of armed conflicts.

We owe a great deal to those who have chased these utopias. So let's all become ocean utopians for a moment and ask ourselves: what would the world be like in 2050 if we fully integrated seaweed, and the ecosystem it supports, into the way the world functions?

Imagining success

It's New Year's Eve 2050, and seaweed features on most dinner menus. We are now aware of the benefits of seaweed, both for the environment and for our health. Our eating habits, respect for the environment and knowledge of our bodies have changed enormously. Seaweed is also trendy among young people, who have increasingly turned towards a plant-based diet. ▶

Vincent Doumeizel is Senior Adviser on the Oceans to the UN Global Compact and Director of the Food Programme at the Lloyd's Register Foundation. This article has been excerpted and adapted for the RSA from his recent book, *The Seaweed Revolution*

If, in the 1950s, rock music, western films and Hollywood gave us American burgers and sodas, since the 2020s Japanese manga, Chinese soft power and K-pop have sprinkled seaweed onto our plates. Lacto-fermentation makes the taste of seaweed more accessible to the western public. This fermentation also makes it possible to avoid systematically drying it, which is an energy-consuming process.

To meet the growing demand, seaweed cultivation has expanded massively in our utopian world. Efforts have been made to facilitate access to cultivation areas and to accelerate the distribution of offshore concessions. At the same time, the rapid development of offshore wind farms has increased opportunities for cultivation in areas previously untouched by production.

Investments at the global level have accelerated since the UN Framework Convention on Climate Change introduced carbon offset mechanisms linked to seaweed. This recognition and promotion of the role of seaweed for the environment has facilitated access to funding, with many young entrepreneurs investing in the seaweed industry.

International standards have been rapidly adapted through traceability systems and a standardisation effort on the part of international institutions. All this progress has received firm support since the creation in 2028 of UN-Oceans, the first UN agency for the collective management of the high seas.

In India and Africa, seaweed cultivation allows for greater food sovereignty, which reduces nutritional deficiencies and dependence on international aid. Algaculture has its own curriculum in universities, while ambitious training programmes for coastal communities have anticipated the disappearance of non-artisanal fisheries and reoriented people towards aquaculture using seaweed.

She-weed

In the east of Africa, coastal countries have developed new species while integrating other animal or shellfish crops. A large global movement called 'She-weed' has also emerged on the African continent, using this new industry to fight against old patriarchal models of aquaculture and fishing. Active on the latest forms of social media, this virtual community brings together women from all over the world.

The Indian government has made it compulsory for aquaculture production to

incorporate seaweed to limit waste runoffs and reduce negative effects on the environment. Further north, global warming and ice melt have opened up production in Siberia, Alaska, Greenland and Canada. The rapid development of sectors in these areas attracted new populations and marked the beginning of the 'Cold Blue Rush' in our imagined future.

Thanks to the contribution of seaweed and integrated aquaculture products, food insecurity has been drastically reduced. In addition, the use of seaweed protein extracts in animal feed, instead of genetically modified soybean meal from Brazil, has been a major factor in halting the deforestation of the Amazon. More generally, seaweed cultivation, together with the strong development of vegetarian diets, has freed up land for less intensive livestock and other crops.

The profit margins on the sale of edible seaweed also improve the sophistication of biorefineries for transforming certain seaweeds into by-products. Marine plants are used as natural fibres in textiles and are gradually replacing cotton, which requires a large quantity of water and pesticides. Seaweed extracts are also helping to replace plastics.

Cutting cancer rates

Research into algal microbiology has become cutting-edge, with pharmaceutical companies increasingly incorporating seaweed compounds into the manufacture of medicines. This new capacity has been accompanied by advances in nanotechnology and immunotherapy. Thus, since the 2040s, a drop in cancer rates has been observed as preventive and curative treatments based on seaweed increase in efficacy.

By effectively stimulating animals' immune systems and growth, seaweed enabled a 90% reduction in the use of veterinary antibiotics between 2020 and 2040. This decrease explains why, against all expectations, antibiotic resistance declined over the same period. Thus, the antibiotic molecules of 2020 are still efficient today.

In addition, by 2042, the combined action of fermented and non-fermented seaweed almost completely eliminated methane emissions from ruminants worldwide. Moreover, the huge invisible fields of seaweed along coastlines are now able to absorb and store large amounts of carbon. These two factors contributed to slowing down global warming and to achieving the commitments made at COP32, where the Paris Agreement was revised.

Thanks to tidal energy, submerged machines were created in the 2030s, replicating the movements of seaweed in the water to produce energy. Later, in 2043, UN-Oceans decided to turn some seaweed farms into gigantic carbon pumps designed to sequester carbon at the bottom of the oceans, hoping to actively cool the atmosphere.

These advances, combined with other carbon austerity measures, have helped to avert the climate catastrophe that was heralded since the beginning of the century. In recent years, there has even been a slight decrease in the level of greenhouse gases in the atmosphere, which would indicate a cooling in the coming years.

Circular agriculture

The phosphate crisis of the mid-2030s, which began following a depletion of mineral resources and could have led to global famines, was largely resolved by pollutant-recycling systems. Growing these crops, which are capable of recovering phosphate compounds from fertilisers at sea and reusing them, has enabled the creation of a regenerative and circular agriculture between land and sea.

Most recently, the increased sophistication of techniques using iodine from seaweed, combined with the launch of tropospheric drones and nanotechnology to seed clouds, has increased our understanding of the water cycle. It is therefore now possible to transport rainwater to desert regions. The emergence of new arable land, coupled with increasing ocean resources, makes it possible to sustainably feed a growing and ageing population that is less prone to disease.

So, in less than 30 years, humans have succeeded in mastering the complete cycle of the three major essential compounds: water, carbon and phosphate. For the first time in our history, we have managed to feed our entire population properly.

And the best is yet to come...

A feasible future?

This projection may be fiction, but it is feasible. Idealistic for some, or nightmarish for others, it is within the limits of what is possible with current scientific advances. The most uncertain part is our common desire to implement this integration of the oceans to help solve the major challenges of our generation.

No doubt there will be sceptics who will see this imagined future as a bizarre flight of fancy. But while it may be impossible to predict the



“The fight for seaweed is an intergenerational commitment to hope and optimism”

future of humanity, it is easy to recount its past. Life originated in the ocean billions of years ago and only very recently began to evolve outside the water. Our connection to the sea is unique and timeless. As a condition of life on Earth, our relationship with this immense expanse could decide the future of civilisations.

An ocean view fills us with serenity. Seeing the sea, swimming in it, immersing oneself in seawater and sunshine is a joy. The human body is essentially made up of water. The ocean is not part of our environment, we are part of the ocean's environment.

As a father of three, I cannot bring myself to watch those already being called ‘Generation Covid’ experience the predicted extinction of our species. This fight for seaweed is an intergenerational commitment to hope and optimism.

But we are feeding our children with fear when we should be providing them with solutions and a source of optimism. There is hope. The research into seaweed and the projects that have been launched, both locally and globally, hold great promise for the future. It is a future where world hunger, pollution, certain diseases, climate change, loss of biodiversity, social inequality and impoverishment will be reduced.

By reconnecting with living things and collaborating with the marine prodigies with which we share our origins, we can bring about an ecological, geopolitical, medical, energetic, social and humanist revolution.

The seaweed revolution. ■

Above: A Kappaphycus seaweed farm in Zanzibar



CENTURY OF INNOVATION

The Student Design Awards celebrate 100 successful years supporting visionary products

by Anton Howes and Anna Markland

Next year marks a significant milestone, as the RSA celebrates 100 years since the inception of the Student Design Awards (SDAs) and runs the final round of this iconic programme. In 2024, we are launching the Design for Life Awards, bringing together the SDAs, Pupil Design Awards and Catalyst Entrepreneurship Awards to nurture the skills and ideas the next generation needs to regenerate our planet. But before we look to the future, we wanted to reflect on the incredible achievements of the past century.

The SDAs, launched in 1923 in collaboration with the V&A and driven by visionary silk manufacturer Frank Warner, aimed to bridge the gap between art and commerce. Going beyond recognition of exceptional design students, Warner envisioned a platform to foster the emerging field of industrial design.

In their inaugural year, titled the ‘Competitions of Industrial Design’, submissions poured in

from around the world, with entrants from as far as Australia, Canada, South Africa and Pakistan. During their first year, over half of the winners and commendations were bestowed upon talented women, a significant accomplishment for the time.

Iconic design

In the early 1950s, the competitions expanded their scope to include craftspeople, clerks and individuals from various industries. David Carter, a former naval radar mechanic and student at London’s Central School of Art and Design, won in 1950 for his design of a domestic solid fuel burning appliance. His prize included a travel bursary that allowed him to explore design in Scandinavia, setting the stage for an illustrious career, which notably included his design of the iconic Stanley Knife.

Margaret Hall, who received an award in 1959 while attending Bromley College of Art,

Anton Howes
is Historian in Residence at the RSA

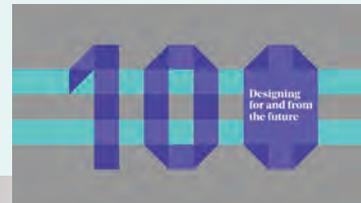
Anna Markland
is Head of Innovation and Change at the RSA



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also embarked on a transformative journey to Scandinavia which shaped her identity as a designer. She later spearheaded the creation of a department at the British Museum dedicated to designing its permanent galleries and special exhibitions.

A student at Canterbury College of Art named Martin Lambie-Nairn clinched two awards, in 1963 and 1964, for typography and advertising design, respectively. His subsequent achievements ranged from designing the BBC's iconic brand to conceiving the satirical television puppet show *Spitting Image*.

In the 1970s, the SDAs welcomed team submissions, paving the way for the formation of numerous successful collaborations. Jony Ive, later renowned for his work as Chief Design Officer at Apple (including his vital role in the designs of the iMac, iPod and iPhone, among other products) was a student at Newcastle Polytechnic when he won the award twice in the late 1980s for envisioning the designs of a future landline phone and an automated teller machine.

Transformative journeys

Less well known is that Ive's Apple colleague, Richard Howarth, also earned an SDA in 1994 while studying at Ravensbourne College of Design and Communication. Howarth's winning design, the 'Telepathik Fish' (an iPod-like device for music subscription), proved instrumental in kickstarting his career. He credits the RSA's travel bursary, which enabled him to visit Sony designers in Japan, for opening doors to exciting opportunities. Twenty years later, Howarth established the Richard Howarth Award

within the SDAs, ensuring future generations of young designers could embark on similar transformative journeys.

Throughout the years, the SDAs have shifted to focus on design for social impact. Northumbria University student Matt McGrath won an SDA in 1999 for designing the world's first laryngoscope with a built-in camera, radically improving the quality of medical diagnostics. The invention was the foundation of his company, which sold for £72m in 2015.

Elena Dieckmann and teammate Ryan Robinson won an SDA in 2016 for their submission to the brief 'One Man's Trash'. Their idea, 'Pluumo', turns locally sourced waste feathers into packaging that ensures greener food deliveries. 'Pluumo' has gone on to raise over £1m in grants and investment.

Recently, Athul Dinesh, at the National Institute of Design in India, won the 2021 Centre for Ageing Better brief with 'Four Walls', an app to increase the number of accessible buildings and home adjustments for older adults.

As we embark on the Design for Life Awards, we pay tribute to the legacy of the SDAs. This new chapter in our design journey promises to inspire, empower and support the next generation of innovative designers, continuing our 269-year commitment to harnessing design for the betterment of society. ■

■ To get involved, visit thersa.org/pupil-design-awards and thersa.org/student-design-awards

■ To learn more about the Design for Life Awards, visit bit.ly/3Ymw7wL

1. Industrial Design Bursaries Exhibition, 1975
2. Jony Ive, SDA winner and former Chief Design Officer at Apple
3. SDA winners, 2018
4. New branding celebrating 100 years of the RSA's Student Design Awards

Other: SDA events at RSA House, 2023



FROM ONE PLASTIC BAG TO 1,100 TREES

How Isatou Ceesay created an umbrella of environmental solutions in The Gambia

by Miranda Paul

Twenty-five years ago, it took an entire day, from sunrise to sunset, to travel from The Gambia's capital region, Banjul, to a tiny village called Njau. Though the distance between the two points on the map is only 248km (154 miles), the journey involved a local taxi, a ferry crossing over a river with no bridges, nearly a dozen police checkpoints, the transfer of cargo (and people) into another local transport and (almost inevitably) a breakdown or other delay, such as when a driver passing his ancestral village needed to stop to greet his home people.

Today, the journey to Njau can take as little as three to four hours. It's just one sign of the rapid changes in Gambian life. Private cars and vehicles are everywhere. The main highways are paved over almost their entire length. Halfway up the country, a beautiful bridge, completed in 2019, arcs over the Gambia River. The signs of development are everywhere, including one of the most obvious and (to outsiders' eyes) distasteful: rubbish.

Along the roads, plastic bags, bottles and other discarded packaging are rampant. Traffic jams form at intersections in busier towns and villages. Unfinished buildings line the roads, abandoned by builders and families who dreamed of a modern house, but did not have the funds to see the project through.

And yet, as one approaches the village of Njau, there is a feeling of travelling back in time. Unlike neighbouring villages, it is not connected to the national grid. (The generally held belief is that a previous administration withheld the village's electrification because its residents refused to vote for the now-ousted dictator). As in many of the rural provincial areas, residents rely on well water, and many houses are made of traditional mud brick and clay. Most noticeable, however, is how all that litter disappears almost entirely as

you enter the village; Njau's sandy streets provide a welcome, rubbish-free invitation to explore.

Njau's hidden progress

Why is this village so different? Ask anyone, and they'll give you a name rather than a reason – Isatou Ceesay. But if you find her, prepare for a humble reply. "I am not thinking about myself within any situation," Isatou says. "I am living within the situation, but I want to make sure the next generation has a better life. What I did was use the recycling of plastic bags as my umbrella, to be able to gain access to the community and discuss issues that are affecting women and young people in general."

A closer look into Njau's traditional landscape reveals some of the town's solutions to those issues. Solar panels line several roofs and children use solar chargers to keep their tablets and phones charged and running. The clay bricks on the women's skills centre buildings are newly engineered to keep interiors cool. Just across the street are sustainably irrigated gardens, run in partnership with the US's Ohio State University. There, hundreds of carefully grafted saplings are growing in a nursery, waiting to join the thousands of trees already planted over the previous years. And every week or so, visitors from around the world arrive to visit or volunteer with one of The Gambia's longest-running grassroots organisations, the Women's Initiative Gambia (WIG).

Just a few days' stay in Njau also offers any visitor a chance to observe some of the invisible aspects of progress, such as an inspirational mindset, can-do attitude, and an environment where men and women work together. These are just some of the intangible impacts created by WIG, the organisation that put Njau on the international radar. What started with a simple plastic bag clean-up has evolved into a giant umbrella for fighting climate change, reforesting parts of Sub-Saharan Africa, supporting women's empowerment, promoting disability advocacy, and preserving traditional knowledge and culture.

The story of how this village became a beacon for both progress and preservation starts after plastic bags invaded the country, wreaking havoc. Plastic bags killed livestock (when ingested), provided mosquito breeding grounds and strangled gardens. While many ignored the problem or merely complained about its catastrophic effects, in 1997, Isatou Ceesay joined US Peace Corps Volunteer Peggy Sedlak and five other Gambian women to perform the first organised plastic bag clean-up. Isatou remembers, "I began working with five women who definitely trusted me and believed that my concept could be a concept that would support the next generation."

That trust and partnership led them to ultimately settle on an idea to wash and dry the bags, then cut them into strips of 'plarn' ▶

Miranda Paul is the award-winning children's author of more than 20 books including *One Plastic Bag: Isatou Ceesay and the Recycling Women of the Gambia*. She lives in the US with her family and spends her time teaching, travelling and volunteering around the world





“If you have a few people who believe what you believe, you can make a big impact”

Isatou Ceesay

to be woven into recycled coin purses. Their first attempts were rough but, as time went on, they improved their product and peddled it to locals, volunteers and tourists. It was a humble beginning; the town’s residents and even Isatou’s own family pleaded with her to stop cleaning up waste, which was considered embarrassing, shameful and dirty work.

As a young, female, high school dropout from a refugee family, Isatou Ceesay was seen in Njau as the least capable person to lead an organisation. “[My father’s family] are refugees from Mali who settled in The Gambia,” Isatou recalls. “Because of the culture, the community treated us as the minority and some even said, “a slave should be a slave”. It was something that I definitely worked so hard and climbed so hard to make a change for.” At the time, women were also not allowed to be leaders on any local or wider government council; even in their own homes they were discouraged from handling money or making decisions.

And yet, Isatou persisted. Twenty-five years later, her photo is on display at the national museum in Kachikally and in popular city restaurants such as Smile Lounge in the touristy area known as Senegambia. Her story has been told in books and documentaries. Above all, WIG is not only still active, but it has also expanded into nearly every corner of Gambian

society and is inspiring countless individuals and groups to find solutions to problems other than plastic waste.

Initiatives spurred and supported by WIG include Young Environmental Change clubs at nearly three dozen schools in four regions of The Gambia; a tree nursery called Reforest the Future; an educational and nutritional programme for young mothers; school sponsorships; skills training; campaigns against female genital mutilation; alternative charcoal briquette making; savings and bank training; solar panel installation... the list goes on.

Next generation

Today, a shift is happening. Five women now sit on the Njau village council. Isatou and WIG have directly trained more than 11,000 people in sustainable practices. The young children who grew up with Isatou Ceesay – and the children of the other founding women of WIG – are taking charge of the organisation’s future. Since a country-wide plastic bag ban went into effect in 2015, WIG’s focus has shifted to reforestation, climate change and climate justice. Although The Gambia is often called out in the media for its poverty and low literacy rates, there is an awareness and sense of urgency within the country’s youth when it comes to environmental issues and responsibility.

“Today, from the five [original] women, we are supporting 75 communities, and more than 5,000 women and youths directly who benefit from our organisation,” Isatou proudly states. “If you have a few people who believe what you believe, you can make a big impact. So, we are calling the whole world to come, and we join together to build the next generation.”

Whether the issue of the hour is native vs invasive species, the interconnectedness of trees, or the ever-changing language surrounding identity and disability, the Gambians involved in any offshoot of or partnership with WIG are talking – and TikToking – about all of it.

It may still take several hours to travel from Banjul to Njau by car these days, but you don’t even have to set foot in The Gambia to come across Isatou’s wide-reaching (and fast expanding) impact. From a school named after her in Dubai to the children’s book about how her journey started with just ‘one plastic bag’, now published in six languages, Isatou’s story is out there, and it’s making a difference. ■

Photos by
Luke Duggleby
Luke is an award-winning British photographer based in Bangkok, Thailand



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TROPES OF DECEPTION

Climate denial in the mainstream media is pervasive and dangerous – but how to spot it?

by Tom Hardy

I have often wondered how the economic, intellectual and cultural decline signified by the Dark Ages could have erased, for centuries, memory of the civilised advances of the Classical era. It is as fascinating as it is terrifying to witness the answer playing out today, as the obscurantist arguments of the forces of climate denial gain traction in the popular press and broadcast media. Their agenda: to deny the scientific reality of climate change at the behest of those vested interests whose bottom line requires a repudiation of ‘net zero’ and renewable energy technology.

When mixed with a politically engineered mistrust of ‘experts’, the result is a populace blinkered to anything that might upset the creed of eternal extractive growth, including the existential threat of climate collapse.

How can we be so blind to something that is happening right before our eyes?

Now that outright denial of the science is untenable, propagandists have switched tactics, attempting to lull us into complacency by denying the urgency of mitigation. Meanwhile, our acquiescence is secured with a culture war to distract and obfuscate. Masters of this strategy are the so-called ‘think tanks’ of London’s Tufton Street, most notably the Global Warming

Policy Foundation (GWPF), who are welcomed in the media as pundits rather than fossil fuel lobby groups.

What’s more, in an increasingly polarised world, few look beyond their silos for information other than confirmation of their own prejudices. When wildfires hit the town of Bastrop in Republican-controlled Texas, no one would talk about climate change. When Hurricane Sandy hit Democratic stronghold New Jersey and flooded large swathes of Manhattan, it was seen as the obvious cause.

Given the deluge of disinformation emanating from the denialist think tanks, it is more important than ever to be aware of the tropes of deception in the press that feed our complacency. Here are some of the most common tricks and techniques that I have seen used by climate deniers in the media:

Proxy opinion pieces

The Editors’ Code of Practice of the Independent Press Standards Organisation (IPSO) states: “The Press must take care not to publish inaccurate, misleading or distorted information.” However, if an article purports to be an opinion piece, it is absolved of this obligation, and if a journalist sails too close to wilful inaccuracy, they can ▶

Tom Hardy is a member of Extinction Rebellion and of the RSA climate network. He is a Co-Founder of MP Watch, a constituency network monitoring climate denial in parliament and MPs’ commitment to net zero

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Eco-warriors clash in morning commute chaos

COOL COOL SUMM

BY JOHN SMITH

CLIMATE change is just a natural cycle. While climate change has occurred throughout Earth's history, the current rapid warming is unprecedented and caused by human activities. The Earth has always experienced periods of warming and cooling.

While the Earth has undergone natural climate fluctuations in the past, the current period of warming is far beyond what can be explained by natural causes alone. The current warming has already stopped. Climate change is a long-term trend, and short-term fluctuations or pauses in warming do not negate the overall warming trend and the need for action.

REPORTS AND ANALYSIS: PAGES 4-19





“Scientists are sometimes their own worst enemy when it comes to the nuances of messaging”

resort to merely parroting denialist propaganda in the guise of commentary.

This tactic is particularly brazen when commentators reference papers they have written or commissioned elsewhere. When GWPF Deputy Director Andrew Montford uses opinion pieces to repeat assertions from an article Montford himself commissioned from arch-denialist Indur Goklany for the GWPF’s website, he neatly places himself at arm’s length from accusations of inaccuracy. Such distortions are frequently taken up and repeated elsewhere in the echo chamber of the partisan press with the excuse that they, too, are merely ‘reporting on the reporting’.

Disingenuous commentators may also exploit the defence of ‘qualified privilege’, which allows for contentious reporting where the journalist feels there is a social duty to do so.

Cherry-picking

Cherry-picking details from authentic research allows propagandists to skew data to their own ends.

A prime example of this tactic can be seen in Matt Ridley’s contention that there had been no significant decrease in Arctic ice over the last

20 years in his *Times* article ‘Walrus comeback is more good news...’. In it, he cited an Arctic survey chart which, though clearly showing a steep decline, was spun to suggest little change.

Cold, scientific methodology will always lose out to an appeal to emotion and a deceitful misinterpretation of the peculiar shades of scientific language. When the examination of hypotheses involves the time-honoured practice of ‘falsifiability’ (to avoid confirmation bias), it is an easy jump for polemicists to claim that the science is unreliable.

Indeed, scientists are sometimes their own worst enemy when it comes to the nuances of messaging. American physicist Richard Feynman described science as “a philosophy of doubt”. We know what he means but, to the untutored, his stance suggests that the deniers have a case.

Rhetorical questions

Framing deceitful positions as rhetorical questions is another way of remaining at arm’s length from an actionable statement and sowing seeds of doubt that do not need to be evidenced. By artfully couching misinformation as rumination, Guy Walter’s piece for the *Mail on Sunday*, ‘Did Putin Plot With Eco-Warriors To Halt Britain’s Fracking?’, neatly sidesteps accusations of defamation.

Vagueness

Journalists will also hedge their bets with studied imprecision. The use of the emotive ‘fury’ in a headline is geared to elicit vicarious loathing, and inverted commas (‘motorists’, ‘activists’, etc) rally imaginary hordes of indeterminate provenance. Activist and blogger Paul Walter observed, in *Liberal Democrat Voice*, that *The Times* had originated a trend whereby use of single inverted commas were employed “to give a highly contentious paraphrase of what they would like someone to have said, when they didn’t say it”.

An apt example from the canon is the infamous 1978 headline in the *Sun* ascribed to Prime Minister James Callaghan: ‘Crisis? What Crisis?’, a phrase that ultimately entered the public consciousness and was credited to Callaghan for the rest of his life, although he never said it.

Speculation

In a piece for the *Telegraph*, Ben Marlow wrote: “We are yet to see [Extinction Rebellion] staging

violent demonstrations outside China's London embassy." IPSO's response to my complaint, that this was defamatory in its suggestion that Extinction Rebellion (XR) was capable of violence, was that, as "we are yet to see" it, the statement holds true.

When Jeremy Clarkson wrote in the *Sunday Times*: "Maybe Greta could be joined by those Extinction Rebellion halfwits who go to the middle of London [...] rather than going to the slums of Calcutta", I complained that this was misleading, as India has a large XR community. IPSO's response was that Clarkson was referring only to members of XR who are "halfwits", not to the organisation as a whole.

Subliminal messaging

A headline in the *Sun*, "Green Fanatsy" (sic) either slipped past the sub-editor or was a deliberate attempt to implant the idea that banning diesel was a short step to the jackboot on the stair. In many articles, the use of trigger words such as 'threat' and 'mob' ramp up subconscious alarm.

False equivalence

But the rot is not confined to the press. The current Orwellian reframing of 'impartiality' as part of the government's roadmap for BBC reform, has resulted in the broadcaster running scared of objective reporting of issues that might upset the government's growth agenda, lest their charter be revoked. In her McTaggart lecture at the Edinburgh Festival last year, journalist Emily Maitlis gave voice to fears now widespread within the BBC of a return to "bothsideism" – false equivalence masquerading as balanced debate.

In 2017, the protocols of Ofcom (the UK's communications regulator) when "dealing with matters of major political and industrial controversy", made clear that anthropogenic global warming was "broadly settled" and required no challenge. In 2019, this caveat was dropped without explanation.

Having one's cake and eating it

When she resigned, finance manager for the Murdoch press, Emily Townsend, said she could no longer work for an organisation that had run a "misinformation campaign [...] that has tried to divert attention away from the real issue which is climate change".

In its Editors' Code of Practice, IPSO, quite rightly, speaks of "the public's right to know"

and claims that the Code is enshrined in the contractual agreement between IPSO and newspaper.

However, it is apparent that such checks on standards are frequently ignored when the vested interests of some proprietors are under threat. And, when the complaints panel includes representatives of the very publications so often under investigation, this 'contract' would seem to be moot.

Editors will, of course, claim that a move to rein in such excesses would muzzle an open exchange of controversial views. But any code should, surely, differentiate between the controversial and the factually inaccurate.

IPSO's protocols make clear the press has the right to be partisan, to give its own opinion and to publish individuals' views, as long as it takes care "not to publish inaccurate misleading or distorted information" and to "distinguish [...] between comment, conjecture and fact".

How can these directives be enforced when the committee's stock response is that its role is "not to make findings of fact or to resolve conflicting evidence in relation to matters under debate" and that an author is "entitled to select in support of his position"?

If the committee does not accept settled facts, such as the existence of climate breakdown, how can it adjudicate on accuracy?

To be held to accuracy while being given leave to cherry pick is to have one's cake and eat it.

Prioritising change

The introduction to the current IPSO code states: "It has become even more difficult for the public to separate the truth from a murky maelstrom of fake news, propaganda and manipulation [...] by an army of 'bad actors' using social media to further their often-opaque agendas, the public has never been confronted with such a toxic diet of disinformation."

But while IPSO claims to be a 'tough' regulator (it has the power to impose up to £1m in fines), it has never once fined any of these 'bad actors'. Now, more than ever, it is time for regulators to be truly independent bodies. Empowerment of these institutions, free from political interference, must be a priority of the next government.

We cannot wait another 300 years for the next age of enlightenment. ■

■ To find out more, visit www.mpwatch.org

SURVIVE AND THRIVE

Resilience is a new frontier for design, helping communities to respond and adapt to an uncertain future

by Jo da Silva

Whenever I am looking for some inspiration, I think of the tardigrade, a curious, eight-legged creature that is the epitome of resilience. At little more than half a millimetre long, it has been on earth for around 600 million years, survived five extinctions, can endure temperatures of up to 150°C and as low as -270°C, and lie dormant for up to 30 years. It's a survivor and thriver.

It has taken a long evolution for the tardigrade to achieve its impressive state. Our species has considerably less time to adapt to a changing climate and depleting resources, but as designers we can imagine and create a future where resilience is a quality embodied in every project.

What is resilience?

Not too long ago, sustainability was seen as key to human survival and accepted as a fundamental principle of good design. We now know that sustainability is not enough – it needs to be paired with resilience.

Resilience is the process of ensuring that we can adapt, respond to, and overcome shocks and stresses and, ideally, build back better. The growing complexity and interconnectedness of modern life has increased the immediate need for resilience. Whether caused by climate change, biodiversity loss, the Covid pandemic or conflict in Ukraine, when things go wrong, instability follows, including disrupted global supply chains, interrupted services, disabled transport systems, and rising energy and food costs.

The theoretical physicist Stephen Hawking said the 21st century would be defined by complexity. He was right but didn't go far enough... it is also being defined by volatility, uncertainty and ambiguity.

How to define resilient design?

A clearer definition and understanding of resilient design are works in progress. Too often, resilience is misinterpreted as being about managing risk rather than our ability to respond to, and recover from, sudden or severe events by strengthening the natural, social and physical systems on which we depend.

The challenge is to find design approaches that work in different scenarios and at all scales. Every system responds differently to disruptions and needs multilayered tailored solutions to become resilient by design. Imagine a neighbourhood hit by a severe storm: its resilience will be determined by the ability of the structures to withstand strong winds, the community's willingness to pull together, their perception of safety, and availability of funding and skills to repair any damage.

What design strategies lead to resilience?

Sustainability has challenged designers to think about energy efficiency, circularity and supply chains. Resilient design is complementary and focuses on strengthening systems, so they continue to perform under stress, rather than fail suddenly or catastrophically. It is generally

Dame Jo da Silva is Global Director of Sustainable Development at Arup and a Royal Designers for Industry (RDI) Fellow. This article is based on her December 2022 RDI Address



accepted that systems are resilient when they possess a certain set of qualities that help achieve the following outcomes:

1. Failure prevention
 - Being strong and robust, yet also flexible.
 - Includes built-in redundancy, even if at odds with efficiency.
2. Expedited recovery
 - Prepared for failure, so it is localised and limited, avoiding cascading impacts.
 - Skills and material resources are available to respond, to repair damage and to reinstate systems quickly.
3. Transformative resilience
 - Includes the ability to learn and adapt progressively by unlocking social capital, or utilising data and technology.

How do we ensure our work becomes resilient by design?

This step change requires designers to adopt new ways of thinking, embrace uncertainty and contemplate the possibility of failure. When embarking on any project we need to first ask whether we are designing just for today. What about tomorrow's world? Can we imagine the

“The road to resilience and a truly sustainable, regenerative future is going to be bumpy”

changes ahead and their impact? Rather than designing just for known conditions, are we prepared to contemplate the unknown?

Systems that aren't resilient fail because they collapse – suddenly, catastrophically or irreversibly. To make resilience an integral part of design, we must first ask the right questions. Should we focus more design effort on ensuring things fail safely, or do we achieve durability through repairable design that lasts and is cherished? Can we draw on nature for more help in managing the consequences of climate change? And how do we create environments that enhance the resilience of nature and the ability of our children to thrive and flourish in a rapidly changing and unstable world?

Like the tardigrade, we are going to need to adapt in order to survive and thrive. The road to resilience and a truly sustainable, regenerative future is going to be bumpy. Resilience is about how we navigate that journey and design a future where humanity can flourish. ■

Artwork by **Renaud Vigourt** for the RSA. Renaud Vigourt is a French illustrator living in Besançon, France. His work appears in children's books, international press outlets and on screen-printed posters



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CLIMATE CHANGE CANNOT BE STOPPED...

... but we must continue to push for transformational change.

by Ketan Joshi



We are only as doomed as we choose to be.

No matter what we have damaged thus far, we can always fight to prevent worse. Even the Intergovernmental Panel on Climate Change's (IPCC's) most recent 'assessment report', synthesising the best climate science, reiterates that our planet warms roughly linearly with how much planet-heating gas we pump into the skies and oceans.

Our planet is a bathtub, filling up with water. The tap is our flow of greenhouse gases, and the latest data update from the Global Carbon Project shows we have not stopped increasing the flow. The water only stops rising when the tap turns off.

The prevalence of solutions that simply avoid a worse flow rate (rather than stopping the flow itself, as recommended by the IPCC) has resulted in an accumulation of greenhouse gases such that we are now guaranteed to see our planet heat to more than 1.5°C above pre-industrial levels. Every fraction of a degree past that point depends on our shift from half measures to full-throated deployment of climate solutions.

Take 'carbon offsets'. More than 90% of these are presented as 'neutralising' emissions, yet they only buy a promise to not emit what was originally planned. That does not undo your climate harm, much the same way paying a serial killer to murder less

does not absolve you of taking a life. At best, it keeps the tap flowing at the same rate it did yesterday. At worst, fabricated baselines and over-selling of offsets ultimately worsen the flow of emissions.

One proposed solution is 'nature-based' carbon removal, where trees suck CO₂ from the air and store it in roots and soils. But the many gigatonnes needing storage cannot be crammed into the finite space in land-based vegetation. Technologies such as direct air capture can store carbon better but are energy-hungry and prohibitively expensive. Point-source 'carbon capture and storage' is the worst approach, capturing only a sliver of emissions, a green sheen that comfortably enables a net worsening of emissions flow by obscuring the real climate impact.

Slightly slower failure is not a form of success. The reality is that rapid climate action is far more feasible than ever thought. Current rates of clean power generation deployment make old forecasts look very silly. The electrification of vehicles and buildings is picking up pace, and heavy industries written off as 'hard to abate', such as steel manufacturing, are ejecting from that category daily. None of this is going as fast as it needs to, but all of it faster than ever anticipated.

Past failures are locked in, but ensuring future success means recognising how a fundamental fear of transformational change has held us back.

We are only as doomed as we choose to be. ■

Ketan Joshi is an analyst, communications consultant and advocate working with large climate and environment groups to accelerate climate action



REGENERATION RISING

An RSA original podcast explores the work needed for true system change

by Philipa Duthie

A transformational shift has started to take shape in recent years. In sectors and communities around the globe, people are re-evaluating the way we live, work and relate to one another – and the rest of life on Earth. At the heart of this burgeoning movement is the recognition that, if we are to have a future, we need to rethink who we are as a species and our role on this planet.

The extreme weather events of the past season – from record-setting heatwaves in Europe to the worst wildfire season recorded in Canadian and North American history – show undeniably that we are living in ‘The Age of Consequences’. Human activity has put unsustainable pressure on Earth’s dwindling resources and is destroying the vital life-support systems that all living beings depend on for their survival.

The revered assumptions of western modernity – the narrative of endless human progress and advancement – have set us, as coach and author Giles Hutchins argues, on a “collision course with collapse”. But averting planetary-scale ecosystem destruction will require more than investment, incentives or technological innovation, even at scale. It will require a complete paradigm shift: a radical reimagining of our current systems – from economic and political to food and energy.

Most importantly, it will require a new collective story for humanity. One that celebrates our fundamental interconnection with all life on Earth and galvanises collaborative action toward regenerative futures.

This is the premise of RSA Oceania’s specially commissioned podcast, *ReGeneration Rising*, which returns in October 2023 for a second series co-hosted by 2021 RSA Bicentenary Medallist Daniel Christian Wahl and me. Featuring conversations with leading thinkers at the forefront of the regenerative movement, the podcast explores how we can be regenerators of the places, communities and ecosystems that we inhabit. Seeing ourselves as part of a network of living relationships shifts our participatory awareness and helps us cultivate an ethics of care for the living beings around us.

In series 2, Daniel and I explore what it means to work regeneratively in service to all life and be an agent for systemic change. Guests include Satish Kumar, winner of the RSA 2023 Bicentenary Medal, filmmaker Nora Bateson and writer Carol Sanford. We also speak with practitioners working at the forefront of this shift and look at how regenerative approaches are being applied across fields such as business, education, agriculture, design and development.

Systems change requires bravery, creativity and collaboration. Yet, this creative potential is precisely what the burgeoning regenerative movement offers us – the ability to rethink our relationship with the world and our own humanity. ■

■ To stream the first series of **ReGeneration Rising** now, visit thersa.org/oceania/regeneration-rising-podcast

■ To receive updates on series 2, subscribe to the RSA podcast at thersa.org/podcasts

Philipa Duthie is director of RSA Oceania and co-host of the upcoming RSA podcast series *ReGeneration Rising*

Image from Victor / Unsplash

TAKE IT SLOW

One Fellow's quest to transform global clothing production

by Cristyn Bevan

In 2016, my business partner, Paul Cackett, and I were working to create a sustainable outdoor brand called 'Hoox': clothing and accessories that we hoped would reinvigorate fly fishing and promote awareness of good water stewardship in the process. As we set about researching supply chains and the broader fashion industry, we soon realised that 'fast fashion' was one of the worst offenders across many environmental and ethical areas, including water consumption and waste.

We learned that 27m tonnes of cotton are produced every year and that fashion is the second largest consumer of water in the world behind agriculture; it is predicted that the fashion industry will contribute 26% of the global carbon budget by 2050. To grow the cotton needed for just one T-shirt takes 3,250 litres of water, the equivalent of three years of drinking water for one person; growing the cotton for one pair of jeans takes 8,183 litres. Over 65% of clothing ends up in landfill.

Considering the many other concerns related to global clothing production (soil degradation, pesticides, biodiversity, pollution, human rights abuses), it all adds up to an industry in a mess.

Paul and I decided to switch gears and 18 months ago, along with co-founder Lindsay Page, we began to look at how environmental agriculture technology might be adapted, particularly through vertical farming, to address the issues created by in-field farming. At Calyx Cotton, we have set out to create the blueprint for growing 100% sustainable cotton,

with transparent supply chain data.

Through our recent rounds of research, we have been able to demonstrate that our methodology requires only 9% of the space needed for standard agricultural practice and only 7% of the water used in-field (including organic farming). What's more, it requires zero pesticides (and has zero impact on biodiversity) with just 27% of the nutrient requirements of in-field agriculture and faster growing through all phases.

We are currently working with research teams in the UK and Belgium to optimise our results, find the most suitable cotton variant and understand the commercial data behind it all. Ultimately, the goal is to locate Calyx Cotton facilities next to garment mills around the world, thus addressing the supply chain carbon footprint by removing the need for shipping.

There is a huge opportunity here in the UK to be part of the revitalisation of the textile industry and the move towards 'slow/quiet fashion' and to support those fashion brands championing the need to address sustainability in the industry. ■

■ To learn more, please contact: cristyn@calyxcotton.com



Above: Cotton variants are grown under differing conditions in the Calyx lab to find optimal output for the plants

Cristyn Bevan is a branding and advertising industry consultant and a founder of Calyx Cotton

ACTION

Prepare to set off on your own personal climate journey.

by Matt Winning

The most common question, and by far the most important one, I am regularly asked about climate change by the public is “What can I do about it?” Most people are eager to know how they can contribute.

Taking part. Joining the fight. Doing something. But what?

There is so much confusing advice. Change your light bulbs. Stop flying. Go back in time and kill yourself as a child. It can be difficult to know what really makes a difference.

Perhaps the most important step, however, is to expand our understanding of what constitutes climate action.

More often than not, it is viewed through a very personal lens. What is my carbon footprint? What steps can we each take to reduce our household energy consumption, our food, our travel emissions? All good steps, for sure. But often these are hard changes to make, and many people cannot afford to do so. Inequality means not everyone has equal access to action.

Looking inwards like this, though, will only get you so far. The real change starts when we look outwards.

For instance, where we bank really matters, because it determines who does what with our money on a much larger magnitude. Your savings and pension are likely out there doing more damage than you think, while the scale of investment in mitigation required to achieve global climate targets needs to be from three

to six times larger over the next decade. But, when society shifts to say that we only want our savings invested in a clean transition, this shifts the social licence of fossil investors. Groups like Make My Money Matter are pushing this agenda by holding big banks and pension funds to account.

I spent years as a climate researcher, hoping I was making a difference, but in academia it can be hard to know. Eventually, I found my own niche by combining my job with my passion. Now, I travel around the country (mostly by train) performing comedy shows about climate change. Audience members often email telling me they enjoyed it and learnt something, and they’ve now switched their energy provider, sold their car or joined a climate charity. This is me looking outwards and making a far bigger impact than I could ever do on my own.

I’m not saying you need to hit the road as a comedian, but I am suggesting you go on your own climate action journey. Ask yourself: what am I good at? What do I have time for? What do I enjoy? The best place to start is in your own community, with local groups of likeminded people who share the same goals. Community is the bridge to meaningful climate action. ■

Dr Matt Winning is an environmental researcher with a PhD in climate policy, a stand-up comedian and author of the book *Hot Mess: What on Earth Can We Do About Climate Change?*



Watch now:
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