

nonesuchⁿ

Inspiring Change

Hillary Gyebi-Ababio
on her role at the
National Union of Students

COVID-19

A focus on Bristol's research

Inside BBC Studios Natural History Unit

With Creative Director
Mike Gunton





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Front cover illustration by Michael Driver, representing just some of the COVID-19 research conducted at the University of Bristol

Left: Palm Temple, a spectacular installation by internationally renowned artist and Bristol resident Luke Jerram (DLitt 2020), now on permanent display outside the main entrance of the University's School of Chemistry. It was originally commissioned by Sky Arts in Italy as a celebration of the 600th anniversary of Brunelleschi's dome of Florence Cathedral (Duomo di Firenze). Based on a spiralling lamella dome structure, this dome is cut in half and the two halves placed in parallel, like the palms of two hands coming together in prayer. While Florence Cathedral is a temple for contemplating God, this new artwork is designed for contemplating nature. Suspended in the apex of the dome is an 'Extinction Bell', which tolls once, 150 to 200 times a day, at random intervals, indicating the number of species lost worldwide every 24 hours. The bell raises awareness of the issue of biodiversity loss and makes audible those events which are invisible to us, and which are occurring simultaneously across the world in multiple habitats.

This theme reflects the work of a number of researchers at the University of Bristol, particularly in the fields of environmental science and ecology. The University of Bristol was also the first UK university to declare a climate emergency, in April 2019, reaffirming our strong and positive commitment to take action on climate change.

Palm Temple has been generously donated to the University by Luke and is open to the public.

nonesuch

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These images of people socialising were taken
prior to any restrictions enforced by COVID-19.



Alumni

A message from your Alumni Association Chair

**Jonathan Phillips (BSc 1994) gives an
update on your Alumni Association**

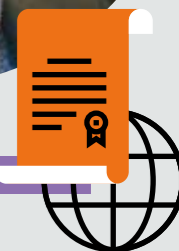
As we look back on the maelstrom of 2020 and the continued impact of COVID-19, I hope you will take some solace in the way in which your University has been weathering this storm and continuing to be excellent in all its endeavours, many of which you can read about in this edition of *Nonesuch*.

While face-to-face interaction among our alumni community has been severely limited, the number of ways in which we've been working together has actually expanded. We have more alumni volunteers than ever before, with a 30% increase on last year. Thanks to all of you who have been (at a social distance or via digital means) supporting the student experience and employability, helping potential students, and building our alumni communities and networks through our various volunteering programmes. In such a time of chaos and anxiety it has been more important than ever for students to know that alumni are there for them, whether through mentoring, careers advice, or a friendly contact on our Bristol Connects platform. You as alumni are important advocates for Bristol, playing a key role in expanding our profile and reputation, which has been crucial during these challenging times. Many of you will have supported our Bristol Volunteers team in the Development and Alumni Relations Office (DARO), who have held six Bristol Connects Live career support talks online, and they have been a lifeline for our new graduates as they struggle to get to grips with what the pandemic means for the job market. A total of 21 alumni volunteers from around the world shared their career stories and, on average, 150 global students and recent graduates attended each one.

The Committee has also been involved in our new Digital Events programme, where many of you will have joined us for a series of exciting online talks and meetings. The Events Team in DARO swung into action very early on in the pandemic, switching rapidly to online platforms, to ensure continued delivery of excellent events to you all. The Committee has been supporting them – and you – whether through hosting, speaking or attending. To date we have run 20 online events with over 2,000 alumni attending, which is incredible. It's great to see you so engaged with Bristol – at last count we had alumni join us from over 70 countries around the globe.

And on that note, please do mark your diaries for our inaugural digital Alumni Festival, which takes place throughout the month of May 2021 and will be an even greater bonanza of intellectual stimulation from the great minds at Bristol. More information will be forthcoming soon – do make sure we have your most up-to-date contact details. It's easy to let us know of any changes via the Bristol Connects platform. ●

bristol.ac.uk/alumni/alumni-association
alumni@bristol.ac.uk



**Join your fellow
alumni and get
involved now**

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give careers advice online
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Attend a Digital Event
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alumni around the world
and enjoy top speakers from
Bristol's University community
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backgrounds with career
support to help them
achieve their potential

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support our students and
recent graduates, as well
as strengthen your alumni
community, by signing up
to one of our volunteering
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ac.uk/alumni/get-involved/
volunteering-opportunities](https://bristol.ac.uk/alumni/get-involved/volunteering-opportunities)



Inset: Undergraduate students in Queen Square, Bristol

University

Black Bristol Scholarship

Last October, the University launched the Black Bristol Scholarship Programme – a brand new £1 million initiative which will enable around 130 Black and mixed-Black heritage students to take up places at the University over the next four years.

The scholarship programme has benefited from generous donations from alumni and friends and seeks to address the lack of representation of Black and mixed-Black heritage students at many leading UK universities. This exciting new programme will support students across a variety of areas including undergraduate, postgraduate and PGCE students. Applications for these scholarships opened last year and we will be welcoming the first cohort of Black Bristol Scholarship students in September 2021.

Speaking about the scholarships, Professor Judith Squires, Provost and Deputy Vice-Chancellor, said: 'We are determined to create a diverse and inclusive university community and recognise that positive support is needed to address the historical underrepresentation of Black and mixed-Black heritage students in particular.'

'I am confident that together with our other initiatives to support our Black students and to decolonise the curriculum, this will help to make our University a truly inclusive environment for everyone.'



Research

World-leading scarring research project launched

In November, scientists at the University began working on a new £1.5 million project launched by medical research charity The Scar Free Foundation.

The five-year study is aiming to identify the gene or genes that cause scarring, which could inform future treatments and enable a future in which scar free healing is possible.

This study will be the first of its kind in the world and will combine large-scale population health data with model organism studies. These will explore the roles that genes play both in wound repair and scar formation. A team of researchers from the University will identify genetic differences and investigate the genetic make-up of scarring by drawing on DNA data from large groups of people. Included in the research will be: people with BCG vaccination scarring, children with cleft lip surgery, women with Caesarean section scarring and patients with internal lung scarring.

The scientists will then combine this data with studies which focus on zebrafish, translucent fish which can regrow tissue and repair wounds quickly.

The University's Professor Paul Martin said: 'The Scar Free Foundation's investment with the University of Bristol gives us a unique opportunity to undertake world class research into the genetics of scarring. The programme will enable us to marry up the fantastic population health cohort approaches that Bristol does so well, with our own wet lab experimental and cell biology studies in order to break new ground in scarring research.'

Above: Dr Beck Richardson with zebrafish

Dr Beck Richardson © libbyaFeher

Alumni

Beautiful manuscript leaf acquired with help from legacy gift



The University Library's Special Collections has acquired a beautiful manuscript leaf from a thirteenth-century Latin Bible, with the help of a generous bequest by the late Anthony John Edwards (BA 1952).

Alumnus Mr Edwards was a History graduate who went on to become the first librarian of Canterbury Christ Church University.

Likely to have originated from Glastonbury Abbey, the handwritten page in question contains the beginning of the Old Testament Books of Chronicles, which tell the story of Israel and Judah from the Creation. The first word of the book, 'Adam', is marked by an intricately illustrated A, which features creatures and foliage. The fine penwork in the text is indicative of the monks' devotion to their work and the Scripture.

Speaking about the manuscript leaf, Professor Ad Putter, Co-Director of the Centre for Medieval Studies, said: 'This is a wonderful treasure. I have often visited nearby Glastonbury Abbey with students, and it is amazing to think that this was written there some 800 years ago, vanished and has now come home to the South West of England where it was originally created. This beautiful and historic artefact will help us to teach our students how to decipher medieval handwriting.'

University

New Economics, Finance and Management Schools form

Last summer, the University launched three new schools to replace the School of Economics, Finance and Management (EFM).

The newly created School of Accounting and Finance, School of Economics and School of Management will champion disciplinary excellence in their own research areas, while continuing to work closely together to deliver a broad range of multidisciplinary programmes.

We will continue to celebrate the legacy of the School of EFM with our alumni and you will also have opportunities to take part in alumni activities for the new schools!



Research

Student and artist-led collaboration

100 years of Postgraduate Research

This year, the University is celebrating 100 years of postgraduate research. Lily Batten was awarded Bristol's first PhD in 1921 for her thesis '*The British Species of the Genus Polysiphonia*' from the School of Physics. Today, the University has over 3,500 postgraduate researchers, conducting work in every discipline.

As part of the centenary celebrations this year, four postgraduate research students are working with the Brigstow Institute, Bristol Doctoral College and Associate Pro Vice-Chancellor (Postgraduate

Research) to conduct research into the first PhDs undertaken at Bristol between 1921 and 1939. The students will work with an artist to produce a digital artwork, celebrating the last century of postgraduate research and imagining the next 100 years. The output will be screened at a public event in spring 2021.

To join us for the screening or to find out more about the project, please contact doctoral-college@bristol.ac.uk.



Above: Alice Crang testing the sugar content of bottled fruit, Long Ashton Research Station, c. 1949. Photograph by British Council. Image courtesy of University of Bristol Library, Special Collections (DM249/9).

In pictures

University

1 Wellspring Settlement

University of Bristol students have produced a research report to demonstrate the impact of emergency work undertaken by the Wellspring Settlement during the COVID-19 lockdown. The report supported a successful bid by the Wellspring Settlement to secure funding to boost aspirations for people living in Lawrence Hill, one of the most deprived wards in the UK.

Wellspring Settlement is an independent charity and community anchor organisation, formed in February 2020 through the merging of two community organisations, Wellspring Healthy Living Centre and Barton Hill Settlement. As part of Bristol's new Temple Quarter Enterprise Campus, the University has a new micro-campus on the Wellspring Settlement to support work with the community, including teaching, research, widening participation and extracurricular learning opportunities for residents in the area.

Housed in one of three adjoining shipping containers, the University is excited to be one of the new tenants at the Wellspring Settlement, using it as a base to work collaboratively with a range of partners and communities in East Bristol.

University

2 Be More Empowered Portraits

In 2020, the University of Bristol unveiled a series of seven photographic portraits to celebrate some of its Black, Asian and minority ethnic staff, students and alumni who have brought about significant change in Bristol and across the world. The portraits are presented by current and recent staff, students and alumni (pictured) who are themselves leaders in their fields. You can see the full suite of portraits on page 14.

Alumni

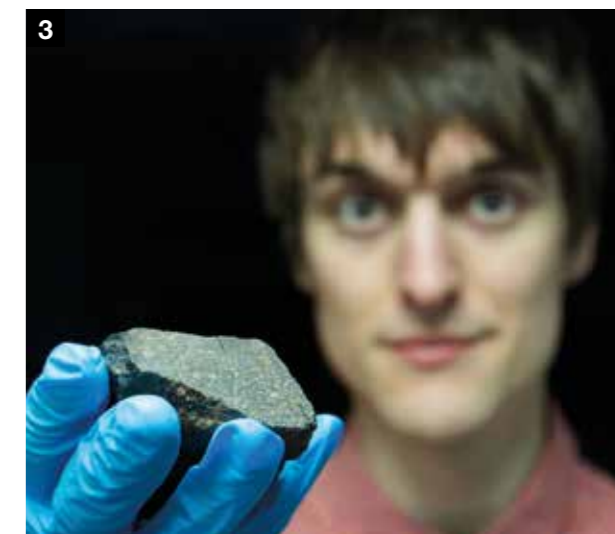
3 Digital Events Programme

From meteorite gazing with Dr Tim Gregory (PhD 2020) (pictured) to an exploration of the science of sleep with the Director of Bristol Neuroscience Professor Matt Jones, career insights from successful alumni and Professor Bruce Hood's advice on dealing with adversity, our digital events programme has been packed with topical discussions and amazing contributions from our alumni community.

Since we moved our events programme online back in May last year, we've delivered over 20 digital events to more than 2,000 people and have been joined by alumni in over 70 countries, including the Dominican Republic, Greece, Iraq, Kenya and New Zealand, as well as those closer to home in the UK.

More than 650 people have joined our Bristol Connects Live series, where over 20 alumni volunteers have shared their career insights to inspire students and recent graduates who are looking to establish or progress their careers.

Reaching our global community has been a spectacular result of our online programme and it is fantastic to be able to bring alumni from all over the world together in one digital space. We look forward to seeing you again at our digital events programme for 2021.



A Bristol life

For over 12 years **Dr John Reeks** has been a part of the University of Bristol: first as an MA student, then as a PhD researcher and now as a lecturer in the Department of History. Here he tells us more about what makes the University such a special place for him.



Dr John Reeks
Department of History

I'm a local boy who grew up on a farm in the Forest of Dean, where I still live now with my wife and baby. It's a small family farm and we have a few horses, a couple of yappy Jack Russells and a herd of suckler cows. Farmers' kids always seem very reluctant to move away from their farms and I'm no exception. So I've always felt phenomenally lucky to have a university like Bristol as my local university.

A working day for me is always busy – invigoratingly busy – and it begins with a very early start in order to get to Bristol in good time. Pre-pandemic the University would be buzzing with a mass of people marching off to lectures and seminars at ten to the hour. Every time you make that movement your heart rate goes up and you start to get a bundle of nervous energy. Then you get one of the greatest privileges of all: to be able to have a fascinating conversation with a group of very intelligent people, hear their ideas and debate with them.

I first arrived at the University of Bristol in 2008 to undertake an MA in Medieval and Early Modern History under the supervision of Professor Ronald Hutton. I fondly remember attending the department's weekly research seminars as an MA student, where you'd hear about an interesting new paper or research project. They were some of my favourite moments – staying after formal teaching had ended and enjoying a glass of wine as it was starting to get dark outside.

After I completed the MA I knew that I wanted to pursue doctoral research but I wasn't in a position to self-fund three or four years of study. I applied for the Keil Scholarship, a fund which was set up by the late Dr Ian Keil (BA 1955, PhD 1965), himself a historian who studied at the University of Bristol. Ian sadly died in 2012, and since then his wife Mrs Teresa Keil has continued the Keil Scholarship in his memory, which is a real testament to their generous natures. The scholarship enabled me to embark on a PhD on parish religion in the mid-17th century, using the records kept by church wardens to understand more about that period of our history. I don't think it's possible to express in words how important people like the Keils are to the University – their support changes lives and allows people to pursue the things that they are most passionate about.

I try to bring the history of the University into my teaching whenever I can because I think it's really important for our

students to have a sense of place and an understanding of the institution. While I was conducting this research, I was delighted to find Ian Keil's name in the Arts Faculty minutes book. He joined the department in November 1955 under the supervision of Charles Ross, the great medievalist. I noticed that he himself received a scholarship, which enabled him to take on full-time research at Bristol. It was very moving to discover that and to know that when he was in a position to do so, Ian Keil went full circle and gave that opportunity to someone else.

Since I joined for my MA, the University – and certainly the Department of History – has changed a great deal. In our department, student and staff numbers have doubled but we've managed to maintain a close sense of community. Last year, of course, because of the pandemic we had to adapt to teaching online and it would be truthful to say that it was a challenging process. Over the summer we had to completely overhaul the curriculum, which required a huge amount of hard work. But we've been able to continue to deliver teaching in the most extreme circumstances, which I'm really proud of.

That being said, I'm really looking forward to getting back to in-person teaching in the future; the excitement that comes with getting people in a room together talking face to face is something that you can't replace. Lecturing is a performance piece, it requires energy, it requires you to use your body and your voice in a way that keeps people engaged and that is best conveyed in a certain type of place. If you take the Tyndall Lecture Theatre in the Physics Building for example, it has a huge blackboard at the back and it always smells of chalk dust. It has these amazing acoustics and a stage that you can march around as you're delivering your material. It feels like you could be giving your lecture in 2021 or back in 1928 when it was built and it's perfect for the theatre of a lecture.

I'm fortunate to work in one of the best departments of History in the country, if not the world. It's friendly, collegial and respectful and that has a massive bearing on the way that we teach our students. What keeps me enthused and energised on a day-to-day basis is my colleagues and the way that we work with and support one another. That's something that's always made me love the University and it's one of the reasons why I hope to stay here for many more years to come. ●

The view from here



'Students are passionate about and deeply aware of what is going on in their society. Students bring about change in really powerful ways and it is truly inspiring to be a part of that.'

Hillary Gyebi-Ababio (BSc 2019) was elected Vice-President (Higher Education) for the National Union of Students last summer. She is the former Undergraduate Education Officer for the University of Bristol's Students' Union and a passionate advocate for education. Here, Hillary reflects on how students have been impacted by the COVID-19 pandemic and the resurgence of the Black Lives Matter movement, and how the national student body are responding to these major global issues.

I come from a family of teachers. My Grandad and my Mum were both teachers in Ghana. For my Grandad, education is a fundamental human right and one of the most important things we can do for ourselves and others. When my parents first moved to this country, my Grandad was insistent on us getting a good education. I don't come from a privileged background, but my parents put a lot of work into making sure my education allowed me to be free, seek opportunities and inspire me to go for what I was really passionate about. When I think about my career, I think about my family and these foundational principles.

My family always taught me to work hard and strive for what I believe in, so when I was elected as Vice-President (Higher Education) for the National Union of Students (NUS) in June 2020 they were very proud. The NUS supports over seven million students from across the UK. It has been both exciting and challenging starting this job in the midst of the COVID-19 pandemic and the resurgence of the Black Lives Matter movement. It is difficult starting a new job from home, particularly such a personal one as this one where I give a lot of talks to students and government figures. Ultimately, though, it has been so inspiring and hopeful to be surrounded by such an empowered student body. By working in the student movement, you are at the forefront of some of the world's major issues. Students are passionate about and deeply aware of what is going on in their society. Students bring about change in really powerful ways and it is truly inspiring to be a part of that.

When I first came to the University of Bristol, I thought of everything in absolutes. Learning from the syllabus and suddenly having access to the most amazing resources, I started to explore so many different perspectives from different sources of information. I was able to learn and unlearn in a way that was really important to the person I am today, and the person I am becoming. Higher education gives people the

opportunity to gather all their knowledge and experience and begin to wrestle with it. It is important because it gives you the space to form who you are and what you believe in. It teaches you not what to think, but how to think, which is so powerful.

I have felt a strong sense of grief for young people who have been so impacted by the pandemic and the resurgence of the Black Lives Matter movement. My job connects me with a lot of students who are feeling uncertain about their futures. Work experience opportunities have been postponed or cancelled and their longer-term job prospects have been jeopardised. Black students have felt the deeply traumatic reopening of the wounds of racism. Responding to the Black Lives Matter resurgence as a Black woman, I have been speaking on behalf of students and on behalf of myself and that can be challenging. When speaking to national and government figures, my own experience does add a personal element to my speeches and that humanity is really important when we are trying to figure out things that sometimes feel bigger than us or beyond our comprehension.

The student movement has responded very quickly to some of the major issues happening in the world today. There is a lot of social change happening and students are galvanised. In its uncertainty and obscurity, COVID-19 obliges us to look and dig deeper, to seek the information that is out there but easy to ignore. The student movement, and education more broadly, is talking about decolonisation, racism, dismantling barriers and structures that have stopped people from being able to thrive. This is meaningful and important work. Higher education can be hugely transformative to the way society operates.

Higher education does, however, still have a long way to go in terms of making everybody feel empowered. Coming to Bristol, I started to become more aware of my race and

my identity. I was a Black woman in a space where there weren't many other Black women. There weren't many people who looked like me, or who were teaching me. Having to grapple with that is a very confronting experience but it's something that many students experience at university. You are made to look at yourself in a way you haven't had to before. This hyper-awareness that came about during my time at university pushed me to educate myself more on the implications of race in everyday life and to better understand structural and interpersonal racism. It gave me the push to educate younger students about the implications of race and the more I understood about it myself, the more I enabled myself to dismantle those structures.

Gaining insight and advice from Bristol alumni was a turning point for me that galvanised me to proactively seek change and develop my career. Chanté Joseph (BSc 2018 and Winner of the Vice-Chancellor's Alumni Award in 2019), for example, was in the year above me doing the same degree in Social Policy. I saw another Black woman pushing the boundaries so fearlessly. Izzy Obeng (BSc 2014), Managing Director of Foundervine, who like me sits on the Alumni Association Committee, was very inspirational. Seeing another Ghanaian woman being so innovative in her field was empowering.

Alumni are informed, experienced and validated by the institutions they come from. They have a deep awareness of what has come before them and they have the hindsight to reflect on their own experience and share their insight. Alumni can be a beacon of light for students. They advise, mentor and welcome a new generation of students. Students are going through an incredibly difficult time right now, but as alumni we have the agency to create change for them through our support and guidance. ●

Researchers, businesses, government and diverse communities must come together to proactively shape our digital future, say Professors Susan Halford and Dimitra Simeonidou, Co-Directors of the University's Bristol Digital Futures Institute

Owning our digital destinies

The digital revolution has transformed every facet of our lives in ways that few of us could have imagined – from our choice of partner through to our future career prospects. Even the engineers who developed the underpinning technologies cannot have foreseen the full extent of it. Indeed, once a technology is released into the world, it tends to evolve in complex and contingent ways – in response to market forces, government regulation and the communities and endusers themselves. There are beneficial outcomes, of course, but also challenges, and not everyone benefits equally.

This has been brought into sharp focus by the COVID-19 pandemic. We have managed to keep our society and economy going as best as possible by relying on digital technologies. We've tried to understand the spread of the virus through data collection and epidemiological computer modelling; we've worked remotely where possible; bought essentials online; and even taken part in virtual gym classes. But many have also struggled.

'We used to refer to the digital divide, but some in the field have started talking about a digital chasm opening up now,' says Professor Susan Halford, whose work focuses on the sociotechnical aspects of digital innovation. 'We hear of people trying to do home schooling with a mobile phone and no keyboard, really basic fundamental things. And it's not just to do with access to devices or networks, though that's clearly important; it's about digital skills, education and opportunities. Who is able to work from home and who is going out to work at risk of exposure to the virus? So, in many ways, it's an opportune time to start talking about some of these issues with respect to digital futures.'

Proactively shaping futures

The next wave of the digital revolution, which will include the extension of technologies including artificial intelligence, augmented reality, virtual worlds and superfast connectivity, presents perhaps even greater challenges and opportunities. But rather than sitting back and letting the invisible hand of markets and other forces dictate how the technologies evolve and for whom, can we be more pre-emptive and proactively shape the future?

Professors Halford and Simeonidou believe we can. They currently serve as Co-Directors of the Bristol Digital Futures Institute (BDFI), which aims to transform the way we create new digital technology for inclusive, prosperous and sustainable societies. Their respective backgrounds, in sociology and engineering, reflect the wider interdisciplinary makeup of the BDFI. This includes academic colleagues across all six faculties and a wider community of partners – from world-leading technology businesses and creative companies to local government and community organisations.

'Typically, when we are looking at digital innovation from a technological point of view, it's a very methodological process; everything has an input and everything has an output as part of a technical system,' says Professor Simeonidou. 'What we would like to do within BDFI is to include social, ethical, environmental and privacy considerations as an integral part of the digital technical design so we can innovate responsibly.'



The Bristol Digital Futures Institute (BDFI)

The Bristol Digital Futures Institute (BDFI) is led by Co-Directors Professor Susan Halford (School of Sociology, Politics and International Studies) and Professor Dimitra Simeonidou (Department of Electrical and Electronic Engineering). For the past decade Professor Halford's work has focused on the interface between social and computational sciences, while Professor Simeonidou specialises in high-performance networks and future internet research. This complementary expertise feeds into the BDFI, which aims to transform the way we create, utilise and evaluate new digital technologies to benefit our society now and in the future.

Collaborative engagement

The BDFI has been made possible through £116 million in funding from a variety of sources, including Research England, philanthropic contributions and the BDFI's partner organisations. The diverse group of 27 partners includes BT, Dyson, BBC, Airbus, Black South West Network, Ashley Community Housing and the West of England Combined Authority.

The full-scale BDFI facility will be based at the University's planned Temple Quarter Enterprise Campus, which is set to deliver more than £600m of employment and financial benefit to the Bristol region's economy over the next ten years. The innovative spaces there will include a neutral lab co-creation environment for University and BDFI partners; a Reality Emulator (an advanced digital twin facility) to test new technologies in alternative futures; and a highly interactive instrumented auditorium for groups of people to make collective decisions.

'Our approach is participatory and experience-based,' says Professor Simeonidou. 'Our digital design methodology will be informed in the very early stages by how technology is being used in context. This will be key in driving technology creation fit for future society. The way technology is consumed, for example, by academics is going to be very different to how it is being consumed by a youth group in their own environment, and it is important to understand such differences. We're involving the end user from the very beginning in our innovation process.'

As soon as COVID-19 allows, the BDFI will physically bring people together into the shared co-creation spaces and labs, including academics, students, industry and local

'...if your design is not informed in the very early stages by how it is going to be used in context, it's very difficult to create technology fit for future society.'

communities, to start the conversation and to start ideating among themselves.

In addition, the BDFI will reach out – through high-speed fibre connectivity – with its collaborative, distributed community across the city, effectively creating its own 'internet for social-technical innovation'. Ultimately, the hope is to take the BDFI approach across the UK and eventually globally.

'A lot of people are talking about futures at the moment, but for the most part in a rhetorical way; whereas we're really, really serious in thinking about how to engage much more directly, constructively and proactively with the futures we're creating here in the present,' says Professor Halford. 'The way that we're engaging different ecosystems and different forms of knowledge in the project of creating futures, with the kinds of technical facilities that we are building, I think that's really quite unique. I'm not sure anybody is doing anything quite like that.' ●

Be More Empowered portraits

A new suite of portraits has been unveiled to commemorate the first anniversary of the University's Be More Empowered for Success programme, which aims to positively enhance the university experience for Bristol's Black, Asian and minority ethnic students. The portraits celebrate some of the University's staff, students and alumni who have led the way in education, the arts, economics, politics, activism and social change, and are on permanent display in the Reception Room of the Wills Memorial Building.

1 Professor Leon Tikly from the School of Education chose to appear with a portrait of Dr Andrew Sheng (BSc 1969, Hon LLD 1999), one of the University's Pro Chancellors.

2 Raeesah Ellis-Haque, Widening Participation and Undergraduate Recruitment Officer, appears with a portrait of Professor Nishan Canagarajah, former Pro Vice-Chancellor for Research and Enterprise.

3 Cyril Ip, Student Advocate, is pictured with Liv Little (BSc 2016), founder of *gal-dem*, a media company committed to sharing the perspectives of women and non-binary people of colour.

4 Antonette Clarke-Akalanne (BA 2018), current master's student, is pictured with the renowned 20th century poet Okot p'Bitek, who took a Diploma in Education at Bristol in the 1960s before writing his breakthrough work *Song of Lawino* in 1966.

5 Hillary Gyebi-Ababio (BSc 2019), Vice-President (Higher Education) for the NUS and former Undergraduate Education Officer at the University of Bristol, is pictured with a portrait of Hannah Dualeh (BSc 2016), former Sabbatical Officer at Bristol Students' Union.

6 Robiu Salisu, BAME Student Inclusion Officer, currently leads the Be More Empowered programme and coordinated these portraits. He chose to appear with a portrait of Lord Boateng (LLB 1973, LLD 2007), whose activism, which has led to meaningful change within the British political system, inspired Robiu.

7 Olivette Otele, Professor of the History of Slavery, presents a portrait of Dame Pearlette Louisy (PhD 1994), Governor General of Saint Lucia from 1997 to 2017.

Photography from left to right top row: Dr Andrew Sheng © Reproduced with the kind permission of Dr Andrew Sheng; Professor Nishan Canagarajah © Nick Smith Photography; Liv Little © Jeff Spicer/Getty Images; Okot p'Bitek © Reproduced with the kind permission of the Okot Bitek Family Archives.

From left to right bottom row: Hannah Dualeh © Jessica Augarde, Bristol SU; Lord Paul Boateng © McAndrew, reproduced under Creative Commons Attribution 3.0 Unported (CC BY 3.0) licence (<https://creativecommons.org/licenses/by/3.0/>).



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A pool of talent and strength

Research

Highlighting just some of the Bristol researchers who have stepped up during the COVID-19 pandemic

Throughout the pandemic the Bristol University COVID-19 Emergency Research Group (UNCOVER) has been pooling resources, capacities and research efforts to tackle this coronavirus and its impact. UNCOVER includes clinicians, immunologists, virologists, synthetic biologists, aerosol scientists, epidemiologists and mathematical modellers and has links to behavioural and social scientists, ethicists, and lawyers. The Lead Coordinator is Adam Finn, Professor of Paediatrics, and UNCOVER is affiliated with the North Bristol NHS Trust and the University Hospitals Bristol and Weston NHS Foundation Trust.

The Elizabeth Blackwell Institute for Health Research (EBI) is co-funded by the Wellcome Trust and the University of Bristol. Nurturing research across disciplines to improve health, the EBI delivers research with real impact on health and healthcare through collaboration and partnership. The EBI has been supporting research into COVID-19 by providing funding and by distributing

funds donated by alumni and friends, to enable University of Bristol academic staff to conduct research in this area.

Alumni and friends of Bristol have been an enormous driver of some of the key COVID-19 research at Bristol in 2020. Over £500,000 has been donated by alumni and friends towards both our coronavirus research and the student hardship fund for those students most affected by events. A huge thank you to all of you now reading about the impact you've had.

Photo © J D Williamson. 'Entering ICU – Doctor Gulia, dressed in full PPE en route to the Intensive Care Unit.'

Alumnus J D Williamson (BSc 2012, MBChB 2015) is a London-based anaesthetic doctor and a photographer. His recent work documents COVID-19 from inside a London hospital, a photographic challenge due to difficult conditions and minimal equipment use. Dr Williamson is shining a light on the pandemic from his own unique angle, using powerful images to communicate from the front line. jdwilliamson.co.uk

Professor Imre Berger and Professor Christiane Schaffitzel

Discovery of a druggable pocket in the SARS-CoV-2 spike protein



When husband-and-wife dynamic duo Professors Imre Berger (Max Planck-Bristol Centre for Minimal Biology) and Christiane Schaffitzel (School of Biochemistry) found themselves in lockdown in March 2020, unable to teach or run their normal workday at the University of Bristol, they did not hang up their lab coats. Instead (while complying with all necessary safety measures) they assembled a cohort of volunteers from their teams and set to work to do what they could to stop COVID-19 in its tracks, as part of the bigger Bristol University COVID-19 Emergency Research Group (UNCOVER).

With only their COVID-19 lab work to focus on, the progress made was unusually fast. In just a few short months they published a seminal peer-reviewed paper in the journal *Science*, one of the most renowned scientific periodicals worldwide, detailing their discovery of a potential 'Achilles' heel' in SARS-CoV-2, the virus causing COVID-19, and how this weakness could help in the fight against the pandemic. While many teams were looking at the possibility of a vaccine, the Berger – Schaffitzel team focused on the structure of the virus itself, and what it could tell us about its rapid and invasive progression through the body. Their discovery could well lead to a prophylactic approach to stopping the spread of this and any similar virus, potentially forestalling future outbreaks.

SARS-CoV-2 is decorated by multiple copies of a glycoprotein, known as the 'spike protein', which plays an essential role in viral infectivity. The spike binds to the human cell surface, allowing the virus to penetrate the cells and start replicating, causing widespread damage. The team used electron cryo-microscopy (cryo-EM) to analyse the SARS-CoV-2 spike at near-atomic resolution and generated a 3D structure allowing them to peer deep inside the spike. In doing so they discovered a druggable pocket that could be used to stop the virus infecting human cells. Intriguingly, their analysis also revealed a molecule binding tightly in the pocket, linoleic acid (LA). Moreover, they could show a dramatic effect – the spike protein could no longer bind as tightly to human cells when LA occupied the pocket, indicating that LA-bound virus may be less infectious. Working with Andrew Davidson, a coronavirus specialist, they confirmed that the LA functions as an antiviral, stopping the SARS-CoV-2 virus from multiplying. Thus, the researchers had not only discovered a druggable pocket in the spike, but also a drug – LA.

LA is a well-studied molecule which plays crucial roles in cellular metabolism. LA is essential, it cannot be synthesised in our body, and we take it up with diet. LA is a key precursor from which our body makes many important

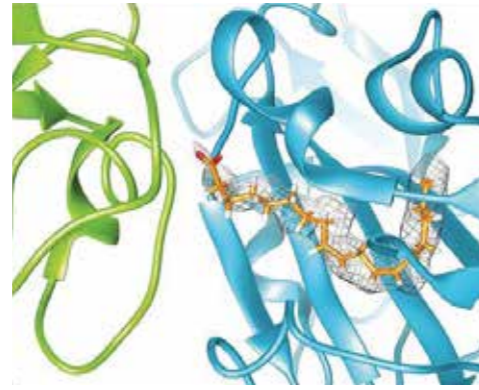
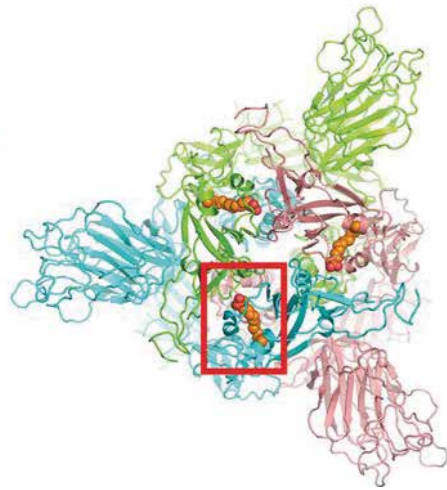
'That time during the first lockdown in 2020 was unique. Terrible, in many ways, but also unique and an opportunity we will likely never have again.'

metabolites to control, for example, immune reactions and inflammation. LA is also needed to maintain cell membranes in our lungs so that we can breathe properly.

It is known from other diseases that tinkering with LA metabolic pathways can trigger systemic inflammation, acute respiratory distress and pneumonia. These pathologies are all observed in patients suffering from severe COVID-19. It appears that the virus, by grabbing and holding on to LA, scavenges exactly the molecule, LA, we depend on to regain control, effectively disarming our body's defences. Indeed, in patients suffering from COVID-19, the serum LA levels are markedly reduced.¹ If a patient with severe COVID-19 ends up on a ventilator, their intake of LA will be even lower, further aggravating their predicament. The team's discovery provides the first direct link between LA, COVID-19 pathological manifestations, and the virus itself. Taken together, this makes it so important to develop possible treatment strategies based on LA.

The next step is looking at how to turn this new knowledge against the virus, and previous studies show reason to be optimistic. In rhinovirus, which causes the common cold, a similar pocket was exploited to develop potent small molecules that bound tightly to the pocket distorting the structure of the rhinovirus, stopping its infectivity. These small molecules were successfully used as anti-viral drugs in human trials and show promise for treating rhinovirus clinically. The Bristol team, based on their data, believes that a similar strategy can now be pursued to develop anti-viral drugs against SARS-CoV-2. In fact, because LA itself is already bound so tightly by the virus, the team believes LA could already be a powerful and immediately available first anti-viral drug before even better anti-virals arrive.

While news of vaccines is important and encouraging, their efficacy and longevity is still unknown. 2020 has shown us how fast a vaccine can be brought to market when the right circumstances present themselves, but even at speed it will have taken almost a year for the first rollout. It is important to continue looking at other ways to combat this virus. An



anti-viral treatment using this discovered pocket could shut down and eliminate the virus before it even enters human cells, stopping it firmly in its tracks. The authors found that this pocket is not only present in SARS-CoV-2, but also in SARS 1 and MERS, which caused the previous coronavirus outbreaks. So, if deadly coronavirus strains presented themselves, chances are they would also have this 'Achilles' heel', and an LA-based anti-viral treatment could therefore work against them just as well.

So, what has it been like to deal with this global crisis as a scientist at Bristol? Speaking about the rapid results of their research, Professor Berger said: 'We were able to work at a faster pace because of lockdown, essentially. We didn't manage our other projects, focusing minds and effort. Our team members and all the scientists we worked with had this unique sense of purpose and incredible dedication to do what they could to help defeat the crisis. It was a special time. We are very proud of them.'

'Professor Adam Finn, of the Bristol Medical School, did a fantastic job organising the effort, and the resulting UNCOVER group really brought everyone together, University-wide. It was very exciting to have our Friday morning meetings, listening to clinicians, epidemiologists and scientists from all walks of life, and to watch our horizons broadening rapidly. It's amazing to see what can be accomplished with such an interdisciplinary taskforce.'

With their return to teaching and a somewhat more 'normal' workload, the team will now require dedicated funding to enable them to realise their vision of a potent antiviral treatment targeting the 'Achilles' heel' in SARS-CoV-2 they found. The ambition of the team is to bring their discovery to the clinic as fast as possible, and Bristol, with its outstanding clinical trial expertise, is an ideal place to set this in motion. ●

Reference

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Above left: Cryo-EM structure of the SARS-CoV-2 S linoleic acid complex. Cryo-EM density of the S trimer is shown. Monomers are in cyan, green and pink, respectively. The structure is shown in a cartoon representation in a top view. Bound LA is illustrated as orange spheres. One LA binding pocket is surrounded by the red box.

Above right: Composite LA binding pocket formed by adjacent RBDs. Tube-shaped EM density is shown.

About Professor Christiane Schaffitzel

Christiane Schaffitzel is also a Wellcome Trust Investigator, coordinator of the EC Horizon2020 ADDovenom consortium and Academic Lead of the Wellcome Trust/BBSRC-funded GW4 Cryo-EM Facility at the University of Bristol.

About Professor Imre Berger

Imre Berger is also Director of BrisSynBio, a BBSRC/EPSCRC Research Centre for Synthetic Biology in Bristol, and a partner in the Wellcome Trust COVID-19 Protein Portal Consortium CPPC. BrisSynBio is part of the Bristol BioDesign Institute.

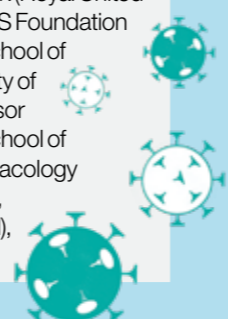


About Professor Reid

Jonathan P. Reid is Professor of Physical Chemistry at the University of Bristol. He has authored over 200 publications in the areas of aerosols in atmospheric chemistry, drug delivery to the lungs, formulation science and disease transmission. Jonathan is a past President of the UK and Ireland Aerosol Society and director of the EPSRC Centre for Doctoral Training in Aerosol Science.

The study 'A quantitative evaluation of aerosol generation during tracheal intubation and extubation' is by Dr Jules Brown (North Bristol NHS Trust, Bristol) working with Professor Jonathan Reid and Dr Bryan Bzdek (Bristol Aerosol Research Centre, School of Chemistry, University of Bristol), Professor Tim Cook (Royal United Hospitals Bath NHS Foundation Trust, Bath, and School of Medicine, University of Bristol) and Professor Tony Pickering, (School of Physiology, Pharmacology and Neuroscience, University of Bristol), and colleagues.

Scientific experiment © Declan Costello



Professor Jonathan P. Reid

Looking at different ways in which aerosol research can support the fight against COVID-19



Below: Scientific experiment to measure the spread of aerosols emitted when singing is conducted in an orthopaedic operating theatre, an environment of 'zero aerosol background'.

As Director of the EPSRC Centre for Doctoral Training in Aerosol Science and the Bristol Aerosol Research Centre, Professor Jonathan Reid's approach to tackling COVID-19 is, naturally, focused on aerosols. 'Aerosols' is a term that is used to refer to a collection of particles that are airborne and with sizes typically smaller than the diameter of a human hair. When we speak, breathe, cough or even sing, we generate hundreds of these particles that someone else could breathe in, transmitting the virus responsible for COVID-19.

A key piece of work from Professor Reid has shown that there is significantly less risk of COVID-19 transmission from anaesthesia procedures than was previously thought. This is an important finding at a time when many operations and NHS procedures have been postponed or cancelled, causing problems for patients in the UK.

Since the outset of the COVID-19 pandemic, there has been much debate about the danger to hospital staff from anaesthetic procedures. Concerns include that inserting a tube in the patient's airway (intubation) before surgery or removing it at the end (extubation) may produce a fine mist of small aerosol particles and spread the COVID-19 virus to nearby staff.

This risk was judged so high that the procedures are classified 'aerosol generating procedures' (AGPs) for which respirators and high-level personal protective equipment (PPE) are worn routinely, and after which surgery stops while the operating room is cleared of aerosols and special cleaning is undertaken. These requirements have dramatically slowed surgery and contributed to increases in NHS waiting lists for surgery, with similar problems in hospitals worldwide. Despite the presumed risk, no direct measurements of aerosols have ever been made during these potential anaesthetic procedures.

In a paper published in *Anaesthesia*¹ Professor Reid and fellow researchers at Bristol have shown that anaesthetic procedures may only produce a fraction of the aerosols previously thought, much less than would be produced during a single regular cough. This now brings into question whether the procedures should in fact be designated AGPs. These results should help inform future PPE guidelines by providing evidence on the relative risk of aerosol generation associated with tracheal intubation and extubation.

For safety reasons, this study was not performed on patients with COVID-19, but on other patients to demonstrate the aerosols produced during these procedures which are common during anaesthesia and in intensive care. While the evidence around aerosol generation during these procedures is reassuring, the risk of SARS-CoV-2 transmission has not been directly studied. The team's interpretation rests on the widely accepted link between aerosol generation and infection risk. The paper detailing these research results has gone to the UK government, with the expectation that the information will

'Very few other universities are as collaborative as Bristol. I'm proud to have been part of a wider team working on almost every aspect of the pandemic.'

support further studies and a change in guidance around AGPs. In the meantime, the team has moved on to doing similar work but looking at dental surgeries and orthopaedic operations.

In another study led by Professor Reid – himself a keen singer and choir member – collaborative research has shown that singing does not produce substantially more respiratory particles than when speaking at a similar volume. These findings are crucial in providing COVID-19 guidance for live musical performances and the safe distancing of performers and audience. The performing arts have been badly affected during the coronavirus pandemic with live musical performances cancelled for many months because singing was identified as a potential higher-risk activity. This study was influential in changing government guidance on performance and opened up some elements of performing. The study has now been extended for a further 12 months.

In Professor Reid's most recent work a team of researchers is suspending the virus in an aerosol to see how long it remains infectious for, working within a containment level-three laboratory designed to handle bacteria and viruses that cause severe human disease. They are also measuring how much aerosol a patient emits while infected with COVID-19 and whether this varies depending on the stage of the disease progression. This has implications for the current pandemic guidelines and especially rules around social distancing. It has been believed that COVID-19 is passed on through droplets released from the nose and mouth during activities such as breathing or coughing, where the droplets fall rapidly to the ground. However, there is a growing school of thought that in fact the virus may remain in aerosol droplets and collect in places that may be poorly ventilated. Professor Reid's work in this field is expected to further inform government policy. ●

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A pool of talent and strength



Dr Laura Rivino

Immune correlates of hyperinflammation and protective immunity in COVID-19

As we grapple with the nightmare scenario of a global pandemic, scientists around the world, including at Bristol, are diving into research around as many aspects of the COVID-19 virus as possible. One of the key findings to date is that in serious cases the body's immune system goes into 'overdrive'. Evidence accumulated so far suggests that the life-threatening COVID-19 complications are related to immune dysregulation, arising because of viral infection in the form of a hyperinflammatory syndrome accompanied by increased plasma levels of pro-inflammatory cytokines.¹⁻²

Immunologist Dr Laura Rivino is conducting a pilot study that should provide us with a clearer understanding of the immune response underlying both the immunopathology and immune protection in patients with COVID-19. Her team's hypothesis is that it would be beneficial to use a combination of strategies where the anti-inflammatory response can be blocked while simultaneously boosting the anti-viral immune response, with an expectation of ensuring viral clearance and establishment of immunological memory.

Effective therapeutics are now starting to emerge³. Dr Rivino is seeking to understand the nature of the immune response in severe versus mild cases, to inform which patient groups might benefit from treatment with repurposed drugs. Several existing anti-inflammatory drugs are undergoing clinical trials for repurposing, but currently there is sparse evidence supporting the effectiveness of these therapies. Dr Rivino's work in defining the immune profiles in COVID-19 patients across disease severities will help identify a possible approach to drug treatment.

Dr Rivino's research was initiated because much more information is required to understand the mechanisms associated with increased inflammatory plasma cytokines and the interplay between the different immune cells during acute COVID-19. The immune profiles of patients are being studied longitudinally to not only evaluate potential therapeutic targets, but also record ideal windows of intervention to maximise efficacy while minimising interference with the development of protective immunity that is needed to clear virus-infected cells, as well as possibly for long-term protection to re-infection.

The research team started working in collaboration with Southmead Hospital Bristol, by first investigating the immune

response in acute COVID-19 patients enrolled in the Diagnostic and Severity markers of COVID-19 to Enable Rapid triage (DISCOVER) study during the start of the pandemic and then by recalling – at measured intervals – patients who had been discharged, in order to take blood samples. When visiting these patients at the Southmead follow-up clinic Dr David Arnold and Dr Fergus Hamilton reported that over 70% of patients still had ongoing symptoms at 12 weeks post admission, now called 'long COVID'.⁴

Speaking of her experience in researching the effects of COVID-19, Dr Rivino said: 'The inflammatory aspect of COVID-19 is extraordinary and the kinetics of the response of T cells, a type of white blood cell that plays a key role in protection from viral infection, is intriguing. With most acute viral infections you see a fairly rapid peak followed by a drop of the T cell response but with COVID-19 the T cell response seems to be more prolonged and this is different to other acute viral infections. It is taking so long for patients' immune systems to come back to baseline. And we're also seeing this phenomenon known as "long COVID", whereby patients can still feel unwell many months after they've been declared recovered. Does the immune response play a role in this? Research into this virus and what it does will be ongoing. We can now see antibodies and T cell responses developing during COVID-19, so we are presuming there's immunity to the virus, but we don't know how long for. Scientists will also want to start looking at people who've had COVID-19 and recovered and compare their immune response to people who've been vaccinated, once that vaccination programme is rolled out.'

Dr Rivino's team is now also collaborating with Professor Nicholas Timpson and the Avon Longitudinal Study of Parents and Children⁵ (ALSPAC) group to study the immune response in younger people who had milder cases of COVID-19, in collaboration with colleagues Professor Adam Finn and Professor Linda Wooldridge.

Dr Rivino is expecting that the outcome of her team's research will be to use the data generated linking immune profiles and disease outcomes to evaluate potential pathways of intervention to mitigate COVID-19 and to identify existing drugs that could target the identified pathways, as well as understand how inflammation influences the generation of long-term protective immunity. ●

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- ⁵ Based at the University of Bristol, the Avon Longitudinal Study of Parents and Children (ALSPAC), also known as Children of the 90s, is a world-leading birth cohort study. It is the most detailed study of its kind in the world and provides the international research community with a rich resource for the study of the environmental and genetic factors that affect a person's health and development.

About Dr Rivino

Dr Rivino is a Senior Lecturer at Bristol's School of Cellular and Molecular Medicine. She has a longstanding interest in understanding T cell responses in health and disease, particularly during viral infection and vaccination. Her work focuses on the study of T cell responses during viral infections of clinical importance such as dengue virus, human cytomegalovirus, and more recently SARS-CoV-2.



Illustrations © Michele Driver



Dr Saffron Karlsen

Black lives in lockdown – the pandemic experiences of people with Black, Asian and minority ethnicities living in the South West

For many people, the reports that COVID-19 was disproportionately affecting those in Black, Asian and minority ethnic communities was news to them. For Dr Saffron Karlsen, however, it was not. As Associate Professor in Sociology and a specialist in inequalities in health research, Dr Karlsen has spent over 20 years looking at how structural and societal inequalities hamper health and healthcare for those in ethnic minority groups.

Together with her colleague Dr Rosie Nelson, and in collaboration with third sector partner Black South West Network (BSWN), Dr Karlsen spent five months during the spring and summer of 2020 researching what was happening in Bristol's Black, Asian and minority ethnic communities. This has shone a spotlight on the different ways COVID-19 is affecting different communities within Bristol. The rapid release of funds from alumni and friends allowed them to proceed at speed and gather information in real time, while the pandemic was happening. This vital work will inform future research and should feed into implementing systemic changes. As one of the University of Bristol's representatives on Bristol Council's Race Equality COVID-19 Steering Group, involving 90 local stakeholders working together to respond to these issues, and someone also involved in setting up the Bristol Race Equality Network involving partners from across the region, Dr Karlsen can give this evidence the attention it needs.

BSWN completed a study looking at the effect of COVID on Black-run businesses early in the spring, as lockdown commenced. This showed the precarious position of many Black-run businesses in Bristol – unable either to continue working or to access support such as furlough, people were forced to fend for themselves, often without the resources to do so. Other research¹ by University of Bristol colleagues Dr Loubaba Mamluk and Dr Tim Jones also shows that more people with Black, Asian and minority ethnic backgrounds are key workers on the front line which puts them at greater risk of being infected. They also live in conditions which make it much more likely they will get infected at home, and make them much less resilient when they do. The reasons² for this are not down to people's own decisions, but the ways in which prejudice against people with Black, Asian and minority ethnicities affects their experiences of education, of healthcare and in the workplace. From Dr Karlsen and Dr Nelson's study, we see personal details of what living through the pandemic was like for people with Black, Asian and minority ethnicities. Some people talked about the psychological burden of repeated risk assessments for essential workers doing home visits and the ways this added to their fear of being infected. Others talked about the way the neighbourhood support valued by so many during the lockdown was undermined by racism: 'The white middle class neighbourhood helped each other. They didn't help me.'

But while research shows that these inequalities are driven by societal, not individual, factors, people in Dr Karlsen and Dr Nelson's study felt the media were presenting them as something other – encouraging ideas that Black, Asian and minority ethnic people were to blame for their higher death rates because of their genetics or other health conditions, or the way that they chose to live their lives. While this led to further fear among those trying to manage this risk, it also caused frustration. Similarly, people talked about the way the media tried to

use the murder of George Floyd and the escalation of the Black Lives Matter Movement in response, to encourage a belief among the public that they were the cause of the problem. One of the interviewees said: 'There's a bit of a blame with the #BlackLivesMatter protest. The news focused on *this is really going to help the surge of coronavirus, the numbers are going to go up and up and up* and actually everyone on that protest was keeping their distance, they were wearing masks, as much as they could do, they were following rules. And then you've got those pictures of Brighton where you've got families and hundreds and hundreds of people hoarding on the beach and nothing [was mentioned]. Not only did this enable the government to further scapegoat Black people and others involved in the protests as dangerous and criminal, it also directly limited the scale, and therefore the impact, of the protests and people's ability to respond to this perceived ill-treatment.

The interviewees for Dr Karlsen's research self-selected and were predominantly young to middle-aged Black Caribbean women in quite secure economic positions. While this sample probably does not reflect those who might have been hardest hit by the pandemic or the lockdown, it does give a novel perspective compared with much of the research done in this area. The voices of Black people in these socio-economic circumstances have been missing from the conversation.

While there were some positive effects for those with economic security, the spectre of racism – from local support networks to national media and government engagement – had a significant impact on these lives lived in lockdown.

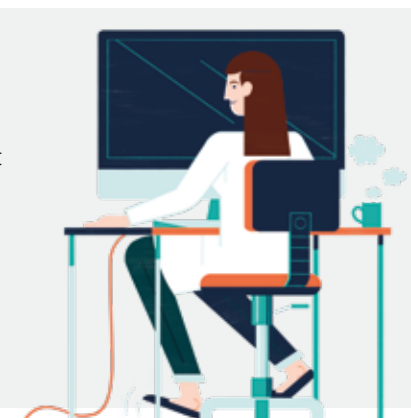
Dr Karlsen and Dr Nelson are now working with local partners to ensure this evidence is fed into policy while they develop a paper for publication. ●

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About Dr Karlsen

An Associate Professor in Sociology, Dr Karlsen's work aims to enable a better understanding of the different ways in which ethnicity has meaning and relevance in people's lives, both for developing awareness of potential group affiliations and as a driver of health and other inequalities.





We talk with Bristol alumnus Mike Gunton (BSc 1979) about his incredible career and learn more about his role as the Creative Director of BBC Studios Natural History Unit.

In 2016, millions of people up and down the UK gathered in their living rooms, biting their nails and peeping through their fingers as a newly hatched iguana fled from a swarm of snakes – narrowly escaping with its life. The iconic scene from *Planet Earth II* went viral worldwide and continued on to win the ‘Must-See Moment’ BAFTA award a year later. It’s a sequence that Mike Gunton, Creative Director of BBC Studios Natural History Unit, has watched hundreds of times, both in the editing room and during the talks he’s given on the Natural History Unit in recent years.

‘I still love it every time I see it,’ says Mike, ‘especially the reaction it gets. It’s an extraordinary combination of brilliant camerawork and brilliant editing. That’s a once-in-a-generation kind of sequence to be honest.’

With a career spanning over 30 years and hundreds of credits including *Planet Earth II* (2016), *Dynasties* (2018) and *Primates* (2020), Mike has seen more than his fair share of incredible animal behaviour. But one of his favourite moments is also one of the first he witnessed.

‘We were in Madagascar in around 1988, filming ploughshare tortoises – which are one of the world’s rarest tortoises,’ says Mike. ‘During their mating season, the males will fight with each other and flip their opponent onto their back. Once one has flipped the other over, they’ll run to the female as quickly as they can and mate with her while the other is trying to get off its back.’

‘To film them, we put our cameraman on a skateboard and wheeled him alongside these male tortoises, who were so crazed with lust that they didn’t even notice us! It was hilariously funny and we managed to get some nice shots of this male on his back, looking over his shoulder helplessly while the other one was mating with the female.’

‘That technique of tracking the camera alongside the animals was quite unusual for wildlife filmmaking at the time, and it helped people to feel that they were right there with the animals rather than observing them. That’s what I’ve tried to do through all of my time: to get people to feel like they’re in the animal’s world.’

After initially wanting to be a social documentary filmmaker, Mike’s path was altered during his time as a Zoology student at the University of Bristol.

‘Before I started university, I’d taken a year out which was almost unheard of in

‘The Natural History Unit was like a stone falling into a puddle that created ripples going out.’



Main image © BBC Studios Natural History Unit



Below: a pygmy three-toed sloth, which can only be found on the Caribbean island of Escudo de Veraguas

those days. Arriving in Bristol was a bit of a shock and I did find that first term quite difficult. But there's no question that university was the absolute making of me.

'I was lucky to make friends with an amazing fellow student who was an extraordinary natural historian. I'd always loved natural history, but I'd never been fully immersed in it and this friend really got me interested in it.

'Combined with that, I had a whole raft of brilliant professors. Professor Savage, who is sadly no longer with us, sticks out in my mind. He was a palaeontologist who was utterly inspiring, charismatic and incredibly knowledgeable. He took a few of us under his wing and I went from struggling in that first term to being an obsessive student, especially when it came to natural history.'

After his undergraduate degree, Mike went on to complete a PhD in Zoology at Cambridge University, before heading back to Bristol to join the BBC Natural History Unit. Since it was formally established in 1957 the institution has welcomed a host of talented individuals through its doors – many of whom also studied at the University of Bristol.

'If you look at the veterans of natural history,' says Mike, 'almost everybody is ex-Bristol Zoology or certainly they've come through some part of the University.'

As well as being a vibrant university city, for wildlife filmmakers Bristol held the benefits of being close to the countryside, home to the South West's regional media outlets and far enough away from London for the Natural History Unit to establish its own creative freedom.

'Over time, the BBC Natural History Unit became a kind of epicentre that spawned satellites around it,' says Mike. 'Independent production companies started springing up, as well as post-production facilities focused on editing, camerawork, grading and sound. The Natural History Unit was like a stone falling into a puddle that created ripples going out. It drew the super-talented to the city. The number of BAFTAs and Emmys that have been won by the sound designers, editors and camera teams who live around here is enormous. They are literally the best in the world.'

Mike found that, even after leaving the University, the

connections he made there proved incredibly useful when it came to creating wildlife films.

'As a young producer I would often phone up one of the professors at the University and say, "Is this animal found in that place?" or "Have I found the right species?". They were effectively our Google. People don't realise that when I started working, all I had was a desk, a notebook and a phone. There was no computer of course – there was no internet! You relied on books and your contacts.

'On a broad level there's always been that connection between the Natural History Unit and the University,' says Mike. 'So for example, we're currently filming *The Green Planet* and we've been working specifically with a couple of the University's academics and with experts at the University's Botanic Garden, who have been very helpful.'

Described as '*Planet Earth*, for plants', the BBC's upcoming series is due for release in 2022 – the BBC's centenary year – and will delve into the hidden life of the green world that surrounds us. Sir David Attenborough fans will be pleased to hear that the veteran presenter will be returning to an onscreen role in the series.

'David has done everything,' says Mike, 'but when I went to talk to him about *The Green Planet* and the approach we wanted to take he used this wonderful phrase. He said: "This is ploughing a new furrow." I don't think there was meant to be a horticultural pun in there but nevertheless!

'These plant organisms play a huge role in the health of the planet and in all of our lives. But the world they're living in is like a parallel universe, hidden by a misty curtain. By witnessing it, we can start to enter that world and to better understand it.'

Alongside never-before-seen moments captured through sophisticated time-lapse photography and robotic cameras, viewers can expect to see more of the world-class storytelling that has put the BBC Natural History Unit on the map.

'You create jeopardy in wildlife filmmaking through individualisation,' says Mike. 'That seedling might be one of a million seedlings, but it's also an individual that is struggling

Previous page: a jaguar patrolling the banks of the jungle

Above: the iguana vs snakes scene from *Planet Earth II* has been watched by millions worldwide

and wanting to beat all those other ones to the light. When you talk about it as an individual, suddenly you care about it and you're immersed. If you can empathise with an iguana, a little scaly lizard, then it's a small step to empathise with a seed, or with a tree.'

But while Mike and his colleagues spend much of their time documenting the wonders of the world, they also find themselves regularly bearing witness to the harrowing impact of the climate crisis.

'You do see amazing endeavour and meet people who are taking action to reverse some of the transgressions that humans have placed upon the earth,' says Mike. 'That dedication is a wonderful element of humanity and it gives you hope. But you also see the opposite. You see rapacious destruction and self-centred greed which can make you feel depressed and helpless.'

'At 94, David has seen things change in his lifetime and I've seen a lot change in mine. There have certainly been some positives and the awareness around the environment is greater now, but I've returned to places which are in much worse situations than they were when I first visited them.'

For those who are passionate about protecting the planet and its biodiversity, Mike has a simple message:

'Consume less. That's what it all boils down to. This species consumes so much more than it needs in terms of resources like land, which is where the rest of the natural world needs to be. If we're using that land or space to generate product for our consumption, then animals and plants can't compete with us because we're too powerful and therefore they get squeezed out more and more.'

'We still don't understand enough about the intricacies of these webs of life. It's like a Jenga tower – you can keep pulling blocks out but eventually someone will pull out one

that makes the whole tower fall down. That's the reason why I've become a bit less optimistic over time; there are still too many of those Jenga blocks being pulled out and nobody knows quite when the last one is going to go.'

So what role does television have to play in all of this? During his career, Mike has heard arguments on both sides: 'Sometimes there's a criticism that the celebratory natural history programmes that show people the wonders of the world paint a false picture,' he says. 'But you can also argue that they inspire people. People want to protect things that they care about and to care about them you need to understand them.'

And while advances in technology may go some way in furthering our understanding and empathy for the natural world, for Mike, strong storytelling is still key.

'Fundamentally, you need imaginative, sensitive, and creative storytelling and to work out what an audience will value. What will give them pleasure and insight and make them feel that they've spent a valuable hour with your programme? I think that's more important than any tech. The tech is a way to get people to experience that, but it still comes down to that key question: what do I want people who watch this to take away?'

'You hope that it's not just an utterly ephemeral experience. So much television is of course and I'm sure ours is to a degree. But you hope that when somebody's watched it, that some of what sticks in their memory is a care, concern, love for and will to protect the natural world. It's the opposite of anthropomorphism, it's trying to make people a little less anthropocentric. You hope that it will remind people that we have these other, extraordinary cohabitants on the planet and that, in the long run, it will be to our benefit to look after them and give them what they need.' ●



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Eco-entrepreneur

**Alumna Rhea Singhal (BSc 2004),
Founder and CEO of Ecoware
– India’s first and largest
sustainable food packaging
company – tells *Nonesuch* about
her move from Pharmacology
to environmentally friendly
tableware, what she learned
from her time at Bristol, and
how to confidently follow
your passion.**



I fell in love with Bristol on my open day at the University. The city had such a nice feel to it, not too large but big enough to be interesting. It was easy to navigate as a student and I always felt at home, which was particularly important, as I was an international student. I made a great bunch of friends at Bristol that I’m still in touch with today.

I had wanted to be a medical doctor since I was very little, but when it came to actually attending university I wavered, and I wasn’t so sure. So instead I chose to study Pharmacology. But I found the degree to be very research based and I personally didn’t like that, I wanted more face-to-face interaction. It was very hard, but I also knew that nothing lasts forever. I was also lucky in that the faculty were always super supportive and honestly felt like family. And I loved all of the societies and extracurriculars that I was part of.

My time at Bristol taught me a valuable lesson – that sometimes there are things you just must do, you must power through, even if you don’t always love it. What you study doesn’t define you. Your life experiences do. There is so much more in life that’s still to happen after you graduate.

In fact, my Pharmacology degree meant that after I graduated I was offered a job at Pfizer in London, where I worked for five years. I absolutely loved it; it was transformational for me. I was in a customer-facing role working on branding and marketing and I learned so much. In 2009 my husband and I moved to India, and Pfizer in India wanted me to have an MBA to work there; my work experience didn’t count. I started studying for the GMAT™ exam for an MBA but I hated it. Instead I chose to become an eco-entrepreneur. The day I was registering my company Ecoware, GlaxoSmithKline called and offered me a job, without the need for an MBA. I turned it down. It was time to carry on going my own way.

I decided to replace single-use plastic food packaging in India with something better for the environment. I was raised primarily in Western society where there is an emphasis on recycling and being environmentally aware, where there are laws and rules enshrining that. That didn’t exist in India when I started my company. There are 1.3 billion people in India, so I just had to start trialling and see how it went. Initially I bought in some products for this trial run, to see how they were received. I ended up supplying the Commonwealth Games! They were our first huge client. In time we had another great success in persuading Indian Railways, the largest food service operator in India, to switch to biodegradables. Now all our packaging is made in India, from agricultural waste products, and is completely biodegradable.

‘Everyone else sees a problem, but an entrepreneur sees an opportunity and a solution. The biggest injustice to the world is not to try.’

Education was key to getting this off the ground in India. No one understood why they should change, and this remains a challenge. Bans on plastic are not always enforced. Also, there are no industry standards for this in India, so we run to global standards. India is a very large nation, so it’s a huge task to change the consumer mindset and help it stick. I go out to schools, businesses and offices giving educational talks about why we should remove single-use plastic. I love it now, but I used to be very shy. But I was recognised for my work by The World Economic Forum and so many things changed. I changed – I had to step into this role to make a difference.

I have 120 employees, 30% of whom are women, and I’m passionate about increasing the role of women in Science, Technology, Engineering and Maths (STEM) and manufacturing. My company is also working with rural women living in poverty, helping them to go into business with environmentally friendly packaging. Scaling up my company means that I can offer employment and improve livelihoods, as well as helping the environment. We have a 100% renewable circular economy model, with no waste. The agricultural waste that we use to make our products is typically burnt which causes air pollution. So we’re also able to make a reduction in that. And I’m so proud that at the end of each year we can say how much we sold and how much single-use plastic that replaced. Last year alone we replaced 50 million items of single-use plastic with our ecoware. Sustainability and profitability can go hand in hand.

I’m often asked what makes someone an entrepreneur. I think that everyone else sees a problem, but an entrepreneur sees an opportunity and a solution. The biggest injustice is not to try. The world needs solutions and who knows if you can do what you want unless you try? Failure is only failure if you don’t learn from it. Otherwise it’s part of the journey.

The highlight of my career so far has been the recognition of my work from the President of India. But you know, I was told that this was not for what I did, but for the huge possibility of what I could still do. And so I go on. ●

Rhea Singhal is Founder and CEO of Ecoware, India’s largest sustainable food packaging company. Ecoware supplies eco-friendly products that are 100% natural, biodegradable and easily affordable. Ecoware disrupted the food packaging industry by introducing a fully compostable alternative to plastic and Styrofoam. The packaging is made from the waste of common agricultural crops that would otherwise be burnt in the open to clear farmland. In 2019 Rhea was awarded the Nari Shakti Puraskar, the highest civilian honour for women, by the President of India.



Travels beneath the earth:

**University of Bristol
Spelaeological Society**

The University of Bristol Spelaeological Society (UBSS), founded in 1919, is the longest-running student society at Bristol. As the society celebrated their centenary in 2019, husband-and-wife duo, Bristol alumni and UBSS members Linda Wilson (LLB 1982) and Graham Mullan (1972) reflect on the magic of caving and the significance of alumni and student partnerships for sustaining a society.

On 31 December 2018, members of the Spelaeological Society sat round a glowing fire in their field headquarters, known affectionately as 'The Hut', in Burrington on the Mendip Hills near Bristol. They were entering their 100th year as a University of Bristol student society, celebrating the new year in the same way they have done every year since their initiation: a fire, drinks and a communal dinner.

'The tradition dates back to 1919 and has not since been broken,' says Linda Wilson. 'Although this year it was a tiny outside gathering in compliance with COVID-19 guidelines.'

Linda is a Vice-President of the society and museum curator of the UBSS collection. She joined the society in 1979, where she met her husband Graham Mullan, a fellow long-term member who is also Treasurer and editor of the society's peer-reviewed annual journal, *Proceedings*.

'"Go straight on" is our society motto,' Graham explains. 'It relates to an incident where two students were lost and one of them, at every turning, proclaimed "go straight on!" That was fine, until they both ended up in a ditch! In caving, going "straight on" is as good an option as any other, though!'

UBSS members have always used The Hut on the Mendips as their base for archaeological digging, caving expeditions and explorations. Known as an Area of Outstanding Natural Beauty, the Mendip Hills is a significant caving spot and is the site where the caving society was first formed.

'When the Bristol Speleological Research Society found human remains at Aveline's Hole on the Mendips, they realised it was a site of huge archaeological significance. After the First World War, the group re-formed under the aegis of the University to continue their research, and the University of Bristol Spelaeological Society was born.'

Initially made up of a mixture of people – some already associated with the University and others who weren't – UBSS has always welcomed people with different relationships to caving and it is this unique formation that generates its distinct character. Part of its success, Graham describes, is the partnership between alumni and students.

'Having the long-term knowledge and history to pass on and make available to new members and new cavers is one of the society's strong points,' says Graham. 'Absolutely,' Linda agrees. 'Right from the beginning the society has always had alumni, student and staff members and a small number of outside members. The partnership between alumni and students gives it continuity and equips us with the knowledge to fully engage with the historic parts of the society and run our museum, library and publications. While the longer-standing members bring insight, the newer student members bring fresh perspectives while continuing the traditions. It's a special dynamic.'

Delving the depths of the subterranean world is an intricate business. It requires technical skill, scientific knowledge of the region and a brave taste for adventure. For Graham, the friends you make on an expedition are with you for life.

'It's easy to become close to the people you cave with very quickly,

especially on an expedition. I've been doing this for a number of years and the friends I've met while caving and through the society are some of my oldest friends. I went on a caving trip to Yugoslavia in 1972 at the end of my first year, and of the ten others on the trip, I still regularly see six of them.'

'The strength of the friendships formed through this society adds a special dimension,' Linda reflects. 'And of course there are the relationships, too – there have been so many caver marriages!'

Linda was 19 when she started caving with Bristol's Spelaeological Society. 'The one thing I didn't have with me was a pair of boots. So Graham offered to lend me some, which lasted precisely two caving trips. Forty years later and we're happy to say we've stayed together slightly longer than the boots did!'

While the Mendips are a particularly significant site for UBSS, the society have also travelled all over the world, to countries such as Indonesia, China, Thailand, Slovenia, Austria, Greece and across the UK. Their first overseas caving expedition was to Ireland in 1948 and there have been trips to County Clare almost every year since.

'It was a difficult trip to organise last summer, given COVID regulations,' Graham tells us, 'but we managed to adhere to the necessary guidelines and were delighted that six undergraduate students and three alumni members were able to go. We have surveyed many kilometres of cave passage in County Clare, and made significant discoveries, including a 2km stream cave in Poulmagree. To be somewhere that very few others, sometimes no one else, has seen is just incredible. It is a very vivid experience.'

Celebrating 100 years of the society is an enormous achievement. In March 2019, UBSS hosted an annual dinner and drinks reception underground in Wookey Hole Caves in Somerset. In October they published their fourth book, *The Caves of Mid-West Ireland*, which was edited by Graham. This was followed by a two-day Centenary Symposium, 'Travels Beneath the Earth', hosted by the University's Geography Department. For Linda, the important thing about the centenary was celebrating the partnership between alumni and students:

'It's so nice to see generations of students involved. Making friends in different age groups was so important for me when I was a student and now, it's nice to be able to give back.'

'University is an abstract concept. When people arrive here, it is the smaller things such as their course, their department, the societies they get involved in that really make a difference to their experience and allow them to form memories. People like ourselves are still so engaged with the University through volunteering and our work with UBSS and I hope that helps inspire the same for other generations.'

So what will UBSS cavers look like in another 100 years?

'The classic Bristol caving student hasn't changed a huge amount!' Graham and Linda chime. 'We regularly get replies to our monthly e-newsletter from older members telling us how familiar everything looks!' says Linda. 'Students still enjoy going to The Hut, sitting around the fire, singing caving songs and playing games.' And, of course, going caving. ●

Clockwise left to right: Linda Wilson and a team of cavers explore the GB Cave in the Mendip Hills; UBSS enjoy a campfire at their headquarters, The Hut; the cavern at GB cave in the Mendip Hills, which was discovered during World War II; the UBSS headquarters, The Hut, among the trees.





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Image: The Fry Building, home to the School of Mathematics, with its specially designed sunscreen which was inspired by a Voronoi diagram © Fotohaus