

Sheffield
Hallam
University

Review

Autumn 2014



Yorkshire gold

*How we helped put on the
grandest of Grand Départs*

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Welcome to Review

Welcome to the Autumn 2014 edition of Review, the Sheffield Hallam University magazine which showcases the work of our staff, students and partners in industry.

It's been an incredible few months, not just for the University, but for people across Yorkshire. In June, we welcomed the World's greatest cycle race to Yorkshire in style. Thousands of people lined the streets, hills and dales to watch the Tour de France and cheer the riders on through the county.

It was a once-in-a-lifetime chance to show the world what Yorkshire has to offer, and as a key sponsor, it was also a great chance for Sheffield Hallam students to get involved in the Tour. We gave our students hundreds of volunteering opportunities along the route of the Tour. You can read more about it in our special feature on page four.

And our strengths in sport and exercise science were once again called upon by World Cup referee Howard Webb, as we helped him prepare for Brasil 2014. Our sport scientists also helped Sheffield boxer Kell Brook become the new IBF world champion in California in August.

Closer to home, our Centre for Regional Economic and Social Research has been highlighting the chronic social and economic divides across the UK, with a series of hard-hitting reports. Their study into regeneration of coalfields areas demonstrates the impact of pit closures on communities around the UK, while their report on seaside towns paints a much more positive picture for the UK economy.

The summer also marked the centenary of the start of World War One, with a guest feature by Sheffield Hallam historian Dr Merv Lewis. His vivid portrayal of Yorkshire's industrial effort during the Great War on page 30 brings home the magnitude of the destruction that Europe saw 100 years ago.

We hope you enjoy reading this edition of Review, and we welcome your feedback - so please take a moment to let us know your thoughts on the magazine. You can drop us a line at review@shu.ac.uk.

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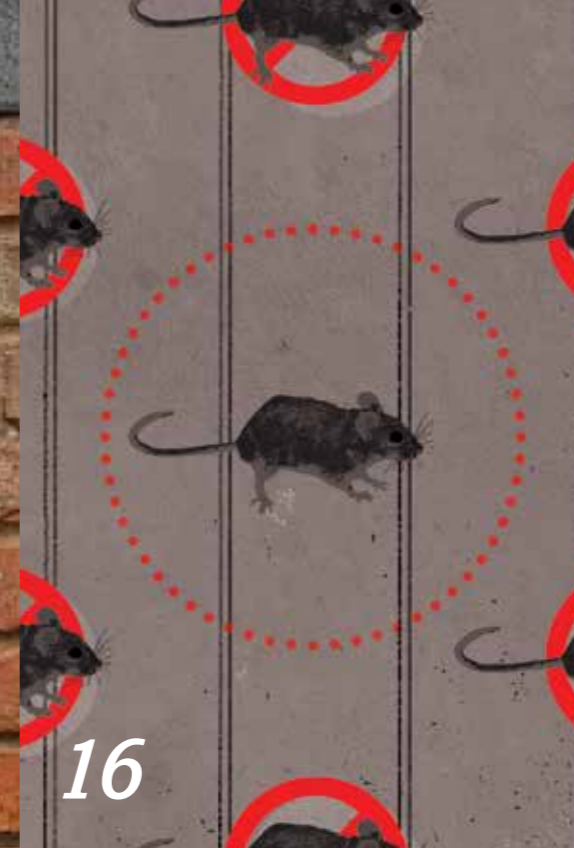
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The world's most famous cycle race came to Yorkshire in July, and Sheffield Hallam was right at the heart of the action. Students and staff volunteered along the route, and we held a range of events and activities to celebrate our sponsorship of the Grand Départ 2014.

When the Tour passed by our door

By Ally Mogg



It was officially “the grandest of Grand Départs,” according to Tour de France director Christian Prudhomme, who couldn’t conceal his delight as Yorkshire hosted the first two stages of this year’s race in glorious sunshine.

With stunning scenery and a turnout of more than 2.5million people, it really was one of the most memorable sporting occasions that the region has ever seen. And the University was right at the heart of it.

Back in February, an historic agreement was signed by the University and Tour organisers, ASO, meaning Sheffield Hallam became an official supporter of the Grand Départ. In order to make the most of it, staff from across all faculties and central departments came together to create a fantastic programme of events and activities for students, staff and people across the city to enjoy.

One of the first projects that came to life as part of the sponsorship was a play written by Sheffield Theatres playwright Chris Bush. BeSpoke was a unique piece of outdoor theatre inspired by local peoples’ stories of cycling.

Performed by a cast of students, and produced and directed by academics from the department of humanities, it ran for three days in Hallam Square, with the audience taking their seats on the steps overlooking the square.

A series of stories that were funny, familiar and at times moving, it was brilliantly performed by the cast. Vice-Chancellor Professor Philip Jones described it as “one of the best nights I’ve had at Sheffield Hallam.” Reviews from the local press praised the students’ performances, the music and the outdoor location.

One of the key reasons for sponsoring an event like the Grand Départ was the range of unique volunteering opportunities that could be created for students.

Emily Burton was just one of the many students and staff who volunteered and she, in her own words, had “the most amazing experience ever.”

Emily, an events management student, currently on her placement year working at the Event Management Hub within the University’s Business School, took on a special voluntary role with Welcome to Yorkshire, that the University was able to secure as part of the sponsorship agreement.

As part of her role she worked at a range of events, including Welcome to Yorkshire’s Y14 conference and the Great Yorkshire Show. She also acted as production assistant at the Team Presentation Ceremony in Leeds on the eve of the start of the Tour, and as a volunteer coordinator.

“In my placement I help set up industry events and CPD workshops, so I was able to put some of what I’ve been doing into practice in my Tour de France roles.

“With Welcome to Yorkshire I worked on three gala dinners, sourcing suppliers and finding venues. I also worked on the organisation of the team presentation event where I had to manage loads of volunteers. It was pretty stressful at times and it needed a lot of organisation to sort all the logistics, but it all came together in the end and was an incredible experience to be part of. It’s something I’ll never forget.

Emily was even able to take a seat in one of the University’s four vehicles that were part of the publicity caravan – the loud procession of sponsor’s vehicles and team cars that parade along the route before the cyclists shoot past.

“I’m a cycling fan. I was brought up in the Lake District and my family are really into cycling. I’ve been over to France to watch the Tour before, so to be a part of it while it was in the UK was great, a once in a lifetime opportunity. The atmosphere on the day was unreal!”



Sheffield Hallam students volunteered in key roles along the route of the Tour de France



In June, the Vice-Chancellor and 11 students – all members of Hallam Union's cycling society – saddled up for a charity cycle ride in which they rode the gruelling stage two of the Tour, from York to Sheffield over one day.

Battered and bruised, and with a few patched up punctures, the group made it into Sheffield in a thoroughly respectable nine hours, having tackled the unforgiving hills of Holme Moss, High Bradfield and Jenkin Road.

The ride aimed to raise money for Marie Curie – the official charity of the Grand Départ – and a new Vice-Chancellor's fund for care leavers, to provide a much-needed financial support to increase access to university for a group of young people that are under-represented in higher education.

The target of £10,000 was reached in August, thanks to donations from far and wide.

On the day after the charity ride, hundreds of local cycling fans descended on the Crucible Theatre to be part of the sell-out Science of Cycling event, that showcased the academic expertise of the University's three sports research centres, alongside Sunday Times writer David Walsh and Olympic gold-medallist Nicole Cooke.

The event saw a panel debate technology in cycling, sports psychology and much more. David Walsh gave a fascinating insight into his obsessive pursuit to find evidence that US cyclist Lance Armstrong was a drug cheat, and Nicole Cooke spoke about some of the early experiences as a professional cyclist that gave her the strength and determination to become a winner.

As well as events and activities for students, staff and local people, we also put together a huge portfolio of school and college outreach activity, to bring the spirit of the Tour into school halls and classrooms across the region and beyond.

Professor Karen Bryan, Pro Vice-Chancellor for the faculty of health and well-being, chaired the cross-University group that orchestrated the range of events. She says: "Our support for the Grand Départ has really raised the University's profile, but crucially it has provided students with the kind of experience that they will never forget, and that will really make them stand out in a crowded job market when they graduate. It's been fantastic to be part of a cross-University project that has brought people together and delivered so much for so many to enjoy."

Sarah Jenkins was the project lead for the University's Tour de France project. It was her role to bring colleagues from across Sheffield Hallam together and ensure that all the events and activities were delivered.

She says: "Although it has been a significant challenge to bring together so many areas of the University together, it has been extremely rewarding to witness the hard work, dedication, passion and sheer will to succeed across the range of staff and students involved."

"This approach to collaborative work on a large scale has created a hugely successful portfolio of activity which will long live in the memory. I particularly enjoyed seeing the University represented so well throughout the Tour, and I hope it has installed a sense of pride across our staff and student community."

Although British riders like Mark Cavendish and 2013 winner Chris Froome had to pull out of the race early on, it has still been a very special Tour, particularly for the people of Sheffield and Yorkshire, who made the Grand Départ officially the 'grandest' ever.

Where the wild things are

By Sarah Duce

An international debate on one of the UK's most contentious and controversial environmental topics is hotting up.

The issue of wilding or re-wilding, which advocates that land and wildlife should be left untouched and unmanaged to allow it to improve biodiversity and recover from the damage caused by people and their behaviours, has divided opinion amongst environmentalists and conservationists for decades.

Those against wilding are of the view that it is an abandonment of our environment and could be highly detrimental to the farming and agricultural industries.

Professor Ian Rotherham, of Sheffield Hallam's natural and built environment department, says: "If we are to 'wild' the landscape, then we need to define where this should be and how the benefits can be maximised, as well as looking at whether we can deliver long-term, sustainable ecologies and significant growth for rural, tourism economies.

"The current system is broken and declining - this may help fix it. But we need to define what we mean by wilding, re-wilding or re-naturing, recognise the problems and encourage humanity to take responsibility for what we have done to nature. Abdication is not good."

In May, Sheffield Hallam welcomed politicians, landowners, academics and practitioners to Wilder by Design Part 1 - the first in a series of conferences to discuss solutions to the situation.

According to Ian, whose expertise covers a range of environmental topics, there are currently catastrophic declines in biodiversity across Britain, Europe and the globe, and our approach to conservation is failing to stop this.

Over the last 50 years, countries such as Britain have been characterised by long-term, irretrievable losses in species richness. These changes have been caused by industrialisation, urbanisation, globalisation and, of course, climate change.

Many problems are driven by underlying socio-economic and political trends and some experts see people and nature as separate and independent from each other, so their answer for ecology to thrive is to remove people from the landscape.

"This is a mistaken belief," says Ian. "Supporters of re-wilding say that we should withdraw human management and leave nature to fend for itself. They feel nature can heal its own wounds and management by people is damaging. But people and nature are a part of the same system and to think that by simply taking people out of the equation will cure the problems is naive, unscientific and historically uninformed.

"To take people totally out of nature is not natural. The skill in nature conservation should be to embed humanity in the natural world in ways that are less damaging and more positive. So we could explore grazing by wild, feral or domesticated herbivores, applied at varying densities and seasons.

"But then there's the argument that introducing large herbivores into small, isolated sites cannot be expected to reap ecological benefits. Animal behaviour is not natural without large carnivores to influence and direct herbivore feeding patterns and movement around a landscape.





"If you re-wild areas without large herbivores or carnivores, it is not a natural process because what remains is an attenuated ecosystem lacking traditional management by local people. Such abandoned lands can become vulnerable to rampant wildfires, for example. Traditionally, these heathlands produced fuel for the poor but when abandoned and de-populated, if it catches fire, it really does burn."

In some parts of Europe, semi-domesticated, rare breed animals such as water buffalo and heck cattle have been introduced to manage landscapes. The animals eat the vegetation, and their dung disperses seeds which makes for a more dynamic and semi-natural ecology.

However, due to the absence of carnivores in the UK, letting nature take its course means there is no way of controlling the numbers.

"In Scotland and the Peak District, there are wild, feral red deer but no top carnivore," explains Ian. "The top carnivore is the motor car or an extreme winter where the animals starve and that's incredibly distressing. So, the message here is that wild is okay as long as it's slightly cosmetic."

There are many unanswered questions from both sides of the argument when it comes to the debate around re-wilding the British landscape.

Ideas of a 'feral nature' raise questions if things don't turn out as hoped. For example, in a wilded environment do we intervene to save starving red deer, or cut back invasive plants such as Japanese knotweed? If we decide to intervene, who does it? What would it involve and who pays the bill?

"The only solution to this is for our landscapes to become 'wilder by design', with large-scale, imaginative, wilding projects in appropriate locations and managed in a way that ensures it to be economically viable. However, these areas won't be wilderness, but wilder eco-cultural landscapes."

"Abandonment to allow nature to follow its own, unmanaged course may appeal to the current crop of politicians who see conservation as needless red tape. In their Brave New World with a Big Society, we won't need nature reserves, wildlife trusts or conservation officers; so there's no need for grants or other funds to pay for conservation. I know plenty of politicians who would love to hear this, but sadly it is not the answer. In fact it would be a disaster."

In September 2015, Ian and his team will welcome global experts to the University to discuss those questions when they host, Wild Thing: Wilder by Design Part 2. They will also look towards introducing large-scale testing and implementation of new methods to conserve landscapes and support future economies.

Ian's latest book, 'Eco-history: An Introduction to Biodiversity and Conservation' discusses the arguments in more depth and explores the issues and trends that impact on the issue and can be purchased via his website, www.ukeconet.org

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New crosier crafted

Two Sheffield Hallam metalwork graduates have presented the Bishop of Sheffield with a new silver and steel ceremonial crosier that they made after winning a design competition.

The new crosier, which can be taken apart and easily transported, was commissioned by the University to commemorate the centenary of stainless steel, after a competition last year invited graduates to design a new crosier for Bishop Steven Croft.

Graduates Stefan Tooke and Nick Palmer were selected by metalwork academics for their design, which they then made using silver supplied by the Assay Office.

The old crosier, which is 100 years old this year, is not allowed to leave the cathedral, and so cannot be used in ceremonies in other parishes. The new crosier, made of stainless steel, silver, gold plated silver and wood, unscrews into three parts and can be easily transported.

It was presented to the Bishop at a ceremony at the newly-refurbished Sheffield Cathedral.

The crook at the top of the crosier is made entirely from stainless steel and is engraved with Psalms 95.1 and 95.7. The flames are fashioned from gold-plated silver and the crucible underneath the head is made from silver. Beneath the crucible is a laser-cut steel tube with blue detail symbolising Sheffield's rivers.

Stefan and Nick both studied metalwork and jewellery at Sheffield Hallam University. They used a combination of traditional welding, piercing and spinning techniques to create the crosier, along with modern approaches, such as laser-cutting. Nick is currently designing the new trophy for the St Leger horse race.



Bishop Steven said, "I'm very grateful to Sheffield Hallam for organising this competition, and to the two great designers and makers who created this wonderful piece. I wanted something that I can use at ceremonies outside of the cathedral, and that captures Sheffield's industrial heritage. The new crosier fits that brief perfectly."

Student designs interactive doorbell app

An interactive doorbell, designed by a Sheffield Hallam University business student, has caught the attention of some of Europe's leading innovators.

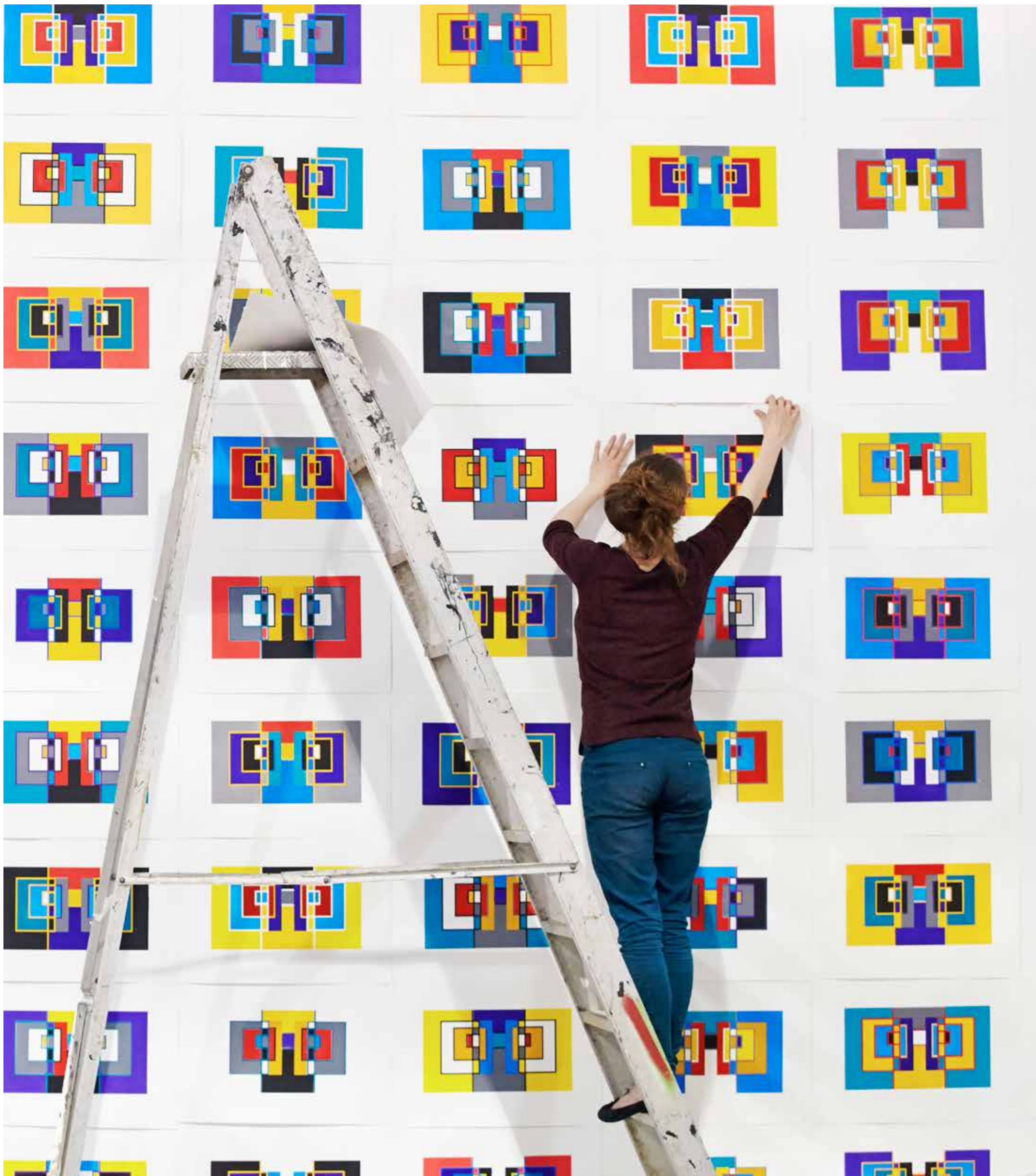
Daniel McGrane, a third-year Business and Enterprise Management student at the University won a paid internship with Sharp Europe after designing SmartBell - a mobile phone app that allows householders to view and communicate with a visitor at their door, whether they are at home, at work or on holiday.

SmartBell is designed to increase home security and allows homeowners to speak to visitors when they aren't present, for example, to give delivery instructions to couriers. SmartBell would notify a person's mobile phone when there is someone at the door, allowing them to see who is there, have a video call or play a pre-recorded message.

Daniel's design has earned him a summer placement amongst some of Europe's leading innovators at Sharp Laboratories of Europe, based in Oxford. He won the placement after entering the company's annual internship competition which asked students to tweet product ideas for the home of the future and was judged by a team of scientists from the laboratories and two independent design experts.

"A bell that sends notifications to a Smartphone was my first idea, and the idea to be able to video call whoever is at your door followed. The exponential growth in ordering online means that there needs to be home technology in place which facilitates this trend."

Managing Director of Sharp Laboratories of Europe, Ian Thompson said; "Sharp would like to thank everyone that entered. We were delighted by the number and breadth of applications, covering everything from Daniel's interactive doorbell to an allergy identification system. It took us six hours to discuss the entries, but we felt that Daniel's SmartBell concept was relevant, innovative and practical."



Founded in the same year as the city as part of the government's School of Art, the Sheffield Institute of Arts is helping Sheffield reinvent itself as the culture capital of the North.

A creative institution

By Joe Field

Sheffield has come a long way in the last 20 years. Once known for steel, coal and socialism, the city is now home to thriving creative digital industries created by a diverse community. And the University's relaunched Sheffield Institute of Arts is right at the heart of it.

Recent years have seen large-scale regeneration in Sheffield, supported by private investment and funding from the European Union and Yorkshire Forward. Ambitious building projects have popped up all over the city centre, including the new market on the Moor, the Winter Garden, Millennium Galleries, and the redevelopment of the Park Hill estate.

There are countless galleries, putting on weird and wonderful exhibitions; a multitude of museums, annual festivals for film, games and music. This year Sheffield held its first festival of design: Design Week.

According to the Sheffield City Region LEP, 7.2 per cent (18,000 people) of Sheffield's working population are employed in the creative industries, well above the national average of 4.2 per cent. And creative and digital industries in Sheffield have an annual turnover of £1.1 billion.

Sheffield Hallam makes a massive contribution to this hub of creativity. Founded in 1843 as the School of Art, the Sheffield Institute of Arts (SIA) at the University is home to more than 2,000 students of nearly 20 different creative disciplines, including art, design, engineering, animation, architecture and photography.

Sheffield Institute of Arts this year celebrates its 170th anniversary with a new identity and reinvigorated degree show, making the student-led exhibition the biggest of its kind in the North.



Over the years many graduates have stayed on in the city to set up their own creative businesses. Former students like jewellery designer Jessica Flinn and product designers Sam Carr and Daniel Schofield have gone on to set up their own successful businesses in the city.

Daniel says: "I set up my own studio with help from the University. I started off with small products which I could afford to make and to bring an income in, and I'm now trying to work my way up to more exciting and bigger projects."

"I design and sell under my own name and through various retailers in the UK, Hong Kong and New York."

In the case of street artist Kid Acne, the former student returns to the Institute regularly by exhibiting in the gallery, giving guest lectures and running art workshops for local children.

Professor Sally Wade is head of the Institute. She says: "These days if someone mentions Sheffield, you're more likely to think of the Arctic Monkeys, Richard Hawley and Henderson's Relish than the miners' strike, the steel industry and quality cutlery. But we're still sending talented, skilled metalworkers out into the world every year."

"We have a very strong heritage of producing talented artists and designers like David Mellor, George Shaw, Godfrey Sykes and Harry Epworth Allen, but we can also claim a role in shaping most of the creative talent here in Sheffield."

"Jarvis Cocker studied here in the 80s. During the day he was sitting in lecture theatres and at night he was writing songs and performing with Pulp. Warp Films producer Mark Herbert studied film here, Nick Park made his first animated short while studying here, and Marina Lewycka wrote her first book while she was studying creative writing here."

One of the biggest players in the Steel City's thriving creative digital industry is Sumo Digital, one of the biggest games development companies in the UK, born out of the ashes of legendary Sheffield software house Gremlin Graphics. Sumo takes on placement students from Sheffield Hallam's games development courses every year, and some of them go on to work for the independent development company.

The Designers Republic, one of the biggest design outfits in the world during the '90s, went through some changes in the last decade, but most of its design talent stayed in Sheffield to set up their own companies. It's a similar story with many of SIA's talented graduates.

Graduates from Sheffield Institute of Arts continue to feed this industry, and take up roles with businesses like interior design company 93ft, run by Tim Hubbard - himself a graduate.

Tim says: "I continue to keep links with SIA because doing so has benefits for everyone. Students get to hear from successful industry experts, and I get placement students, interns and new staff members who are full of energy, enthusiasm and an understanding of what the industry's like."

"Doing a specialised degree is great, but knowing what products sell, what it's like to work with clients, and what the pressure can be like in a commercial environment, are going to give you a head start."

David Mellor Design's incredible factory, founded by Sheffield Institute of Arts graduate David Mellor, is based in nearby Hathersage, and creative director Corin Mellor, one of the University's honorary doctors, is proud of the company's Sheffield roots.

Corin says: "I grew up in Sheffield and have seen it change considerably. Creative subjects have become more important to the city, and have played an integral part in Sheffield reinventing itself."

"It's fantastic to see so many different disciplines brought together under one roof," he says. "It's also really good to see so many students finding their own direction, and to see the professional young talent emerging here in Sheffield."



Reducing the need for animal testing

By Sarah Duce

Using animals to test drugs for humans has always been a controversial subject, with critics arguing that there are other, ethically-viable alternatives. Scientists at the University are working on several projects that could vastly reduce the numbers of animals used.

It is estimated around three million mice are currently being used for research in the UK, but scientists at the University have successfully secured funding for new equipment to enhance 3D cell culture biomedical research. This innovative technology will closely mimic what happens in living organisms, without the need to use animals.

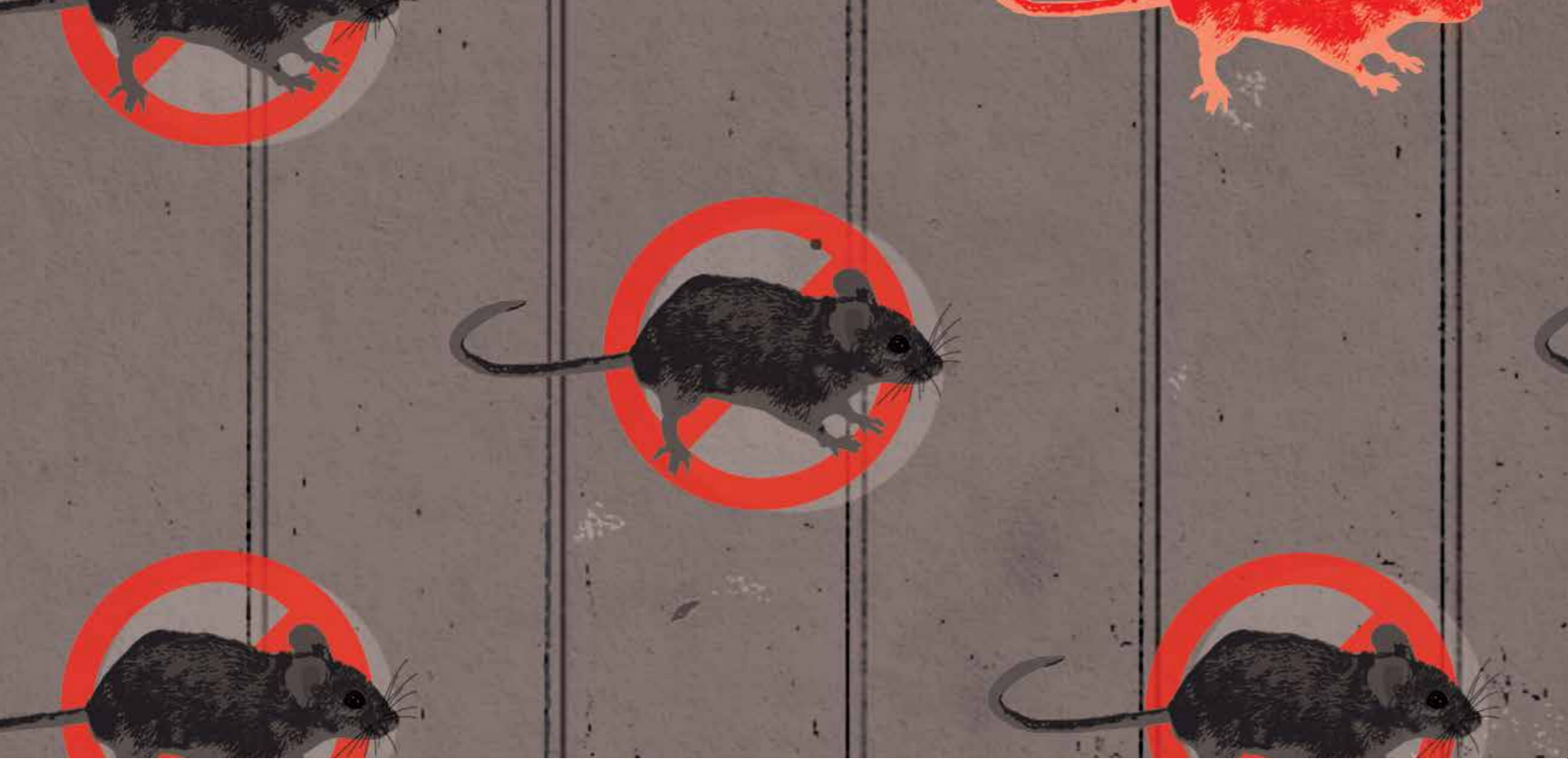
The Biomedical Research Centre (BMRC) recently received £120,000 from the University's Strategic Research Investment Fund (SRIF) – some of which has gone towards the purchase of a hypoxic chamber that creates an environment similar to what is going on in the body.

Body tissue is not normally exposed to atmospheric oxygen, which is approximately 21 per cent of the air we breathe, but the hypoxic chamber allows the growth of cells and tissues in lower oxygen concentrations. Scientists are now able to use the new chamber to explore new therapies within a more physiological-relevant environment. They can use the chamber to give them a more informed picture of a drug's effectiveness in the body, allowing them to determine whether or not it should progress into an animal study.

Dr Christine Le Maitre of the BMRC is currently working on developing a hydrogel therapy that will inhibit disc degeneration, a common cause of lower back pain.

"I've been using 3D cell culture, which allows me to grow disc cells outside of the body and maintain their behaviour they have normally inside the body," says Dr Le Maitre. "If you take disc cells out of the body and grow them in 2D culture, they turn into cells which resemble fibroblasts which are like skin cells, and are not very good for looking at the mechanisms of a disease and what could actually be happening in the body.

"We're going to use the hypoxic environment to look at the regulation of nerve and blood vessel ingrowth into spinal discs. Normally in a disc, there aren't any nerves or blood vessels, which is why it's hypoxic. In disease, you get blood vessels and nerves, which grow into the disc and because it doesn't normally



have nerves, it becomes painful. So if we can find out how those nerves and blood vessels are driven to grow into the disc, we can then devise therapies to stop this process and consequently stop the pain.”

Dr Le Maitre has been working with Dr Chris Sammon from the University’s Materials and Engineering Research Institute to develop a liquid that could be injected into the affected areas and potentially be tailored to regenerate either bone or disc tissue.

Dr Le Maitre, says: “We’re going take adult stem cells from a patient, which can either be from bone marrow or fat tissue, and we can use those stem cells to turn them into cells that resemble disc cells and inject them into the disc that needs regenerating. If you simply take the cells and inject them into the disc without modifying them, they could squeeze back out and form bone which can press onto the nerve and make things a lot worse.

“With the hydrogel, we can mix it with stem cells and other agents, inject it into the spine and the body temperature causes it to turn into a gel which is stable. We can then add specific agents into the gel to tailor it for specific types of tissue to be generated from the stem cells. So, if we wanted to form bone we would mix in hydroxyapatite - a natural component of bone - and that will tell the cells to develop into bone cells, rather than into disc cells for example.

“All the work I have done so far has been in 21 per cent oxygen, so it’s not been under hypoxic conditions. Repeating the research in the hypoxic chamber will allow us to fine tune what hydrogel

agents we need to add to inhibit disc degeneration, and we can then go forward into further testing. This way we will have reduced the need for animal testing, because we will have carried out enough tests to know that this has a strong chance of success.”

In cancer, tumours grow in a chronically hypoxic environment and the tumour cells evolve to be able to survive in extremely low oxygen conditions. Scientists believe these tumour cells become more stem cell-like in hypoxia and mimic what normal stem cells do – which makes it harder for scientists to study.

Dr Neil Cross of the BMRC is working on a new cancer drug that that can weaken the tumour cells’ ability to survive in hypoxic environments.

“Because the cancer cells behave more like a stem cell, it gives them the ability to become drug resistant, so they can pump out what little chemotherapy drugs get into the centre of a tumour,” says Dr Cross. “This might also mean it improves survival rates of the tumour cell. So we’ve got a real interest in anything that will allow us to model these processes and actually observe it going on in cells in real time– which is what this new equipment will allow us to do.”

This work is just one part of a major project led by Professor Malcolm Clench that aims to provide quantitative analysis of how cancer tumours respond to treatment.

Recently, Professor Clench and his team secured over £244,000 in funding from the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs) to develop its Mass Spectrometry Imaging technology, to enhance the way in which proteins found in biological tissue could be quantified.

While conventional analysis can only quantify a small number of proteins, Mass Spectrometry Imaging (MSI) is a powerful tool that is used to map different molecules within tissue sections. It can also produce multiple images of protein responses to medical treatments, as well as correlate these changes with drug distribution.

In previous projects that looked at the level of protein change in tumours following the administration of anti-cancer drugs, Sheffield Hallam researchers found that there was a need to be able to measure the change in protein levels, to allow clinicians to have an accurate picture of how tumours respond to treatment.

Professor Clench says: “If we were to study the activity of 50 proteins within tissue under the usual method, you would need around 25 mice for testing, but by using mass spectrometry imaging, only one mouse would be needed.”

Materials research leads to healthcare innovation

A pioneering Sheffield Hallam University scientist is developing new materials that could revolutionise replacement spinal disc implants in the human body.

Professor Andy Alderson, in collaboration with colleagues at the universities of Manchester and Bolton, is leading research into the use of flexible auxetic materials, which expand when stretched rather than contract.

Professor Alderson is part of the University’s Materials and Engineering Research Institute, and says one potential use for these materials would be in new artificial spinal disc implant devices.

At a House of Lords science and technology reception in May, he told scientists how he is developing “large strain gradient auxetics, capable of undergoing dramatic shape changes when a simple tension is applied”.

Professor Alderson is also collaborating with Central Manchester University Hospitals NHS Foundation Trust to develop an auxetic laparoscopic device that could be used in keyhole surgery.



He said: “The development of auxetic materials for commercial use has accelerated significantly in recent years. Their use in surgery is still relatively new, but developing new materials with improved properties is critical in delivering healthcare provision that is more sustainable and affordable, whilst simultaneously increasing the quality and length of life.”

Frozen food can save families a fortune

New research from the University shows that buying frozen food can cut food waste by half and save an average household up to £250 per year.

Research led by Dr Wayne Martindale from the University’s Business School has shown that three million tonnes of household waste could be avoided per year through better meal planning and by eating more frozen food.

After findings released by WRAP last week, which found that UK households are throwing away a million tonnes of unopened food a year, Dr Martindale’s paper identifies frozen food as a significant solution to the UK’s 6million tonne household waste mountain.

According to the research, frozen food generates 47 per cent less food waste compared to fresh food consumed in the home. Dr Martindale found that households that include more frozen foods in their weekly meal planning could save around £250 per year.

The research findings also discovered that greenhouse gas emissions could also be reduced by 2.4million tonnes a year if households incorporated frozen foods into smarter meal planning.

Dr Martindale said: “These results tell us a great deal about people’s lifestyle choices, and demonstrate clearly that families can save money and waste by simply incorporating frozen food into their meal planning.



“People are simply less likely to waste frozen foods because it’s easier to control portion size and food obviously lasts longer in the freezer. With today’s world being busier and more demanding than ever, frozen foods offer an increasingly desirable, practical and nutritious food choice for busy families.”

Dr Martindale discussed his research on the BBC Radio 4 You and Yours programme in June with TV chef Aldo Zilli, who was more sceptical, and was keen to point out that freezers should just be used for ice cream.



Howard Webb prepares for World Cup heat

The University's expert sport scientists have again worked with Premier League referee Howard Webb, helping him prepare for the heat of the Brazilian jungle in his final tournament.

You don't often find temperatures edging past 30°C and humidity of more than 75 per cent in the English Premier League, but in order to prepare properly for the World Cup in Brazil, referee Howard Webb pushed himself to the limit in the University's environment chamber.

Howard announced his retirement shortly after the World Cup, ending a 25-year officiating career in which he refereed the World Cup Final in 2010 and the Champions League final.

But shortly before heading to Brazil to be part of the FIFA contingent of match officials for his final World Cup, Howard and sport scientists from the University's Centre for Sport and Exercise Science worked out a programme of heat and humidity training to help his body get used to the conditions.

Howard undertook six sessions on the treadmill in the environment chamber, with conditions controlled to replicate the 30+ degree heat and humidity of World Cup venues such as Manaus and Fortaleza. The training involved timed sprints with short breaks between each burst, mimicking the role of a referee during a match.

"I want to be as prepared as I can," he said. "Coming to the chamber here gives me that chance. If it gives me a small advantage, if it means I can perform to my potential there, then why not do it?"

Alan Ruddock from the CSES team said: "In the conditions in the north of Brazil, the intensity of a match means a referee like Howard can expect to sweat about 10 pints of fluid during the game. The controlled environment that we've created here gives him the chance to experience that and prepare for it before he goes to Brazil."

At one of the sessions, television crews from BBC Sport and Sky Sports came along to film and interview him about his pre-match preparations, as part of their World Cup coverage.

In Brazil, Howard took charge of a group match between Colombia and Ivory Coast, then was chosen by FIFA to take charge of what was to be his final professional game, the fiery second round encounter between hosts Brazil and South American counterparts Chile.

Brook takes world title in thrilling fashion

Sheffield boxer Kell Brook is the new IBF world welterweight boxing champion after a thrilling victory against Shawn Porter in California on 16 August.

Kell Brook emerged victorious in a tough battle against American favourite Shawn Porter, in a split decision that has ended the Sheffield fighter's long and frustrating wait for a world title.

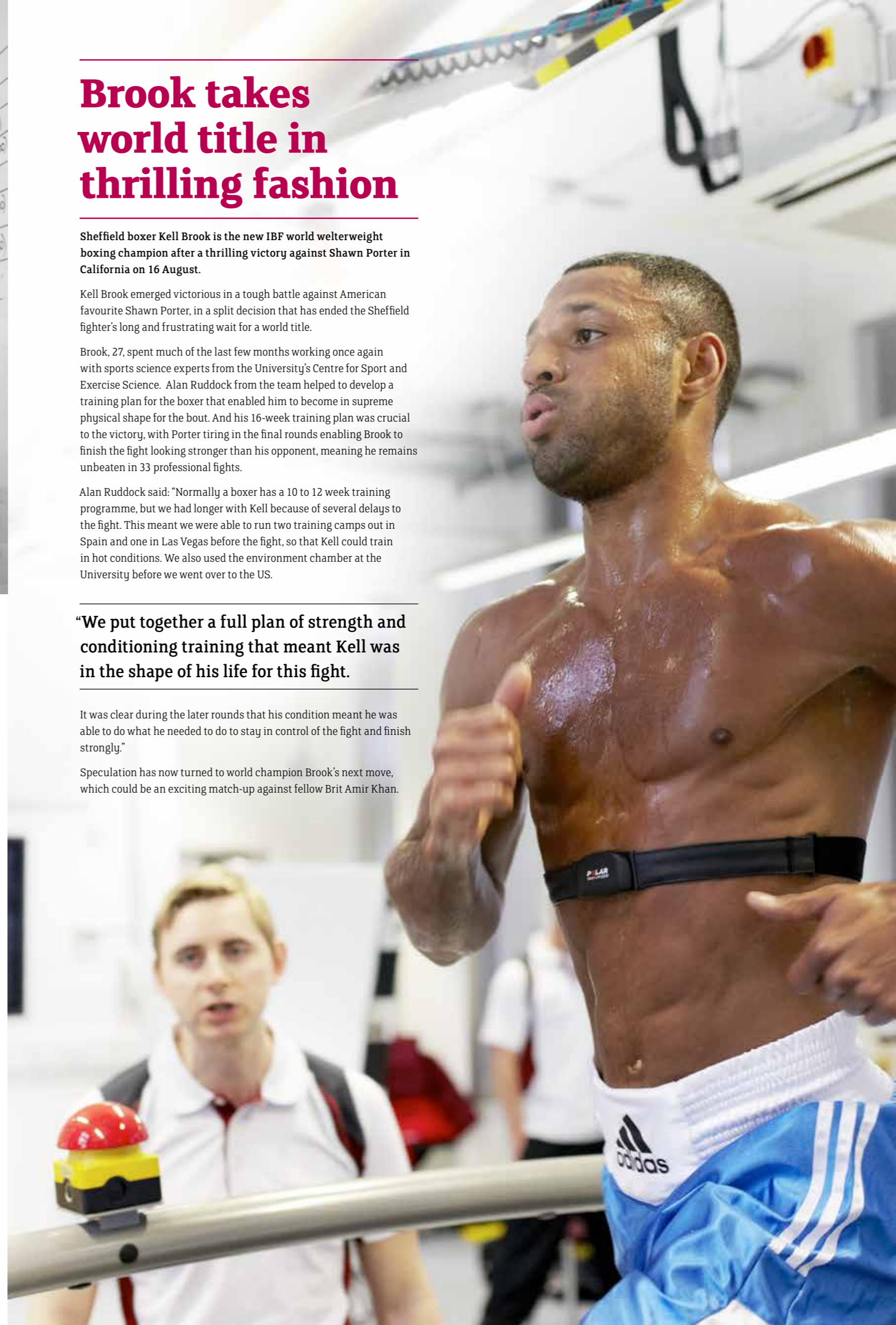
Brook, 27, spent much of the last few months working once again with sports science experts from the University's Centre for Sport and Exercise Science. Alan Ruddock from the team helped to develop a training plan for the boxer that enabled him to become in supreme physical shape for the bout. And his 16-week training plan was crucial to the victory, with Porter tiring in the final rounds enabling Brook to finish the fight looking stronger than his opponent, meaning he remains unbeaten in 33 professional fights.

Alan Ruddock said: "Normally a boxer has a 10 to 12 week training programme, but we had longer with Kell because of several delays to the fight. This meant we were able to run two training camps out in Spain and one in Las Vegas before the fight, so that Kell could train in hot conditions. We also used the environment chamber at the University before we went over to the US.

"We put together a full plan of strength and conditioning training that meant Kell was in the shape of his life for this fight."

It was clear during the later rounds that his condition meant he was able to do what he needed to do to stay in control of the fight and finish strongly."

Speculation has now turned to world champion Brook's next move, which could be an exciting match-up against fellow Brit Amir Khan.





Student Dan Reed with England Table Tennis team-mates Karina Le Fevre and Kelly Sibley



Rebecca Turner, Ellie Faulkner, Siobhan O'Connor and Amelia Maughan

Students' Commonwealth Games success

Victorious students from the University have returned from Glasgow 2014 with six medals after representing the home nations across a range of sports.

Rebecca Turner, Ellie Faulkner, Daniel Reed and Jessica Taylor bagged three silver and three bronze medals in swimming, table tennis and athletics.

Ten talented Sheffield Hallam students in total represented the home nations across a range of sports, including athletics, swimming, hockey, table tennis and weightlifting.

Rebecca Turner was the first of the University's students to win a medal, as she won silver as part of England women's 4x100m freestyle relay team.

On the following day of competition, she doubled her personal medal tally with a bronze alongside sport development with coaching student Ellie Faulkner in the 4x200m freestyle relay.

Ellie said: "It was great to be a part of the Commonwealth Games with so many other Sheffield Hallam students, and I'm really happy that I won a medal. The Games were a fantastic experience, and I'm so proud to have been part of such a successful team."

"The training and support I've had at Sheffield Hallam have been invaluable in helping me prepare for this tournament, and there are lots of opportunities to compete while I'm studying."

On the track, in the absence of a more famous Jess, our own Jessica Taylor smashed her personal best in the heptathlon to take a well-deserved bronze medal.

Competing at her first major senior championships, Jess said: "It's an incredible feeling to have a Commonwealth Games bronze medal. My ambition coming in was to try for a personal best and see where

that got me. To win a medal is beyond my wildest dreams. I was just happy to get selected and have the chance to compete!"

Psychology student Daniel Reed won two medals in table tennis. He won silver as part of the England men's team in the team event, and played brilliantly to win bronze in the mixed doubles against the top seeded pair from Singapore.

Other students selected Joe Dunderdale in javelin (England), Michael Shaw for hockey (Wales), Gareth Long for Hockey (Wales), Chris Freebury in weightlifting (England), Nick Grainger for swimming (England) and Max Litchfield for swimming (England).

Professor's Commonwealth Games film

A Sheffield Hallam professor entertained millions of people this summer as her film, commissioned for the Glasgow Commonwealth Games was shown on national television.

From Scotland with Love is a feature-length documentary about 20th century Scotland and is made entirely of Scottish film archive. A poetic film with no narration or interviews, it explores themes such as love, loss, work, leisure, war and protest and was broadcast on BBC1 Scotland in June and on BBC4 in July. Virginia Heath, an award-winning director and Sheffield Hallam's professor of film, collaborated with renowned singer/song-writer King Creosote to create an original soundtrack that tells the stories of the film's silent characters.

The 75-minute feature, funded by Creative Scotland and the BBC, was also screened in front of 10,000 people followed by a live performance of the film score as part of the Commonwealth Games Culture Festival at Glasgow Green. A second screening and performance will also take place at the Barbican, London in September.

Virginia's film proposal was chosen from hundreds of applicants, all bidding for the opportunity to mark the Commonwealth Games celebrations. "The response has been amazing," said Virginia, who has won several awards including Best Short Film at the Berlin International Film Festival and was a European Film Academy



Awards nominee. "We wanted people to reflect back on how things were in Scotland. It's all about the past but it makes you think about the present and the music score written by King Creosote is a vital element of the entire film. "The whole process of making the film took about six months and it's something I've felt so privileged to be a part of."

Industry launch for high-powered technology centre

A revolutionary scientific technology in high demand with companies such as Rolls-Royce has been celebrated at an international conference in Sheffield.

The HIPIMS 2014 conference saw the official launch of the National HIPIMS Technology Centre, supported by a number of huge companies, including Rolls-Royce, IHI Ionbond, Biomet, Sandvik, Fraunhofer, Trumpf Hüttinger and others.

The new centre marks a key part in the journey of HIPMS (High Power Impulse Magnetron Sputtering), a scientific plasma technology, backed up by multi-million pound equipment in the University's £6million laboratories, which pulses out several megawatts of power to create a highly-ionised gas-metal plasma.

The plasma can then be used to produce a special coating to enhance performance of hip joints, turbine blades, piston rings and even space satellites.

Professor Papken Hovsepian, head of Thin Films Research Centre at Sheffield Hallam, said: "The launch of the National HIPIMS Technology Centre represents all we have achieved in this science over the past 13 years. Sheffield Hallam deserves the credit for this – it saw the potential in what was then a very new and unproven concept and backed us.

"Now HIPIMS is acknowledged as a world power in coatings technology."

Professor Wolfgang Diehl, deputy director of Fraunhofer IST and chair of the Sheffield Hallam and Fraunhofer IST Joint HIPIMS Research Laboratory, added: "Sheffield Hallam is known for the upscaling of HIPIMS technology, and for many years, has acted internationally as the home of industrial HIPIMS.



"It was only natural for Fraunhofer IST to support the establishment of the National HIPIMS Technology Centre. Implementing novel technologies and serving industry is fully in line with the Fraunhofer philosophy, therefore we wish the new UK initiative in the field of HIPIMS great success."

Professor Paul Harrison, pro vice-chancellor for research and innovation at Sheffield Hallam, said: "Creating a National HIPIMS Technology Centre will enable us to develop Papken and Arutiun's world-class research with new and existing commercial partners."

Game Republic awards



Games development at Sheffield Hallam went up a level after students won top awards at the annual Game Republic Student Showcase.

The Game Republic event featured 26 projects by 85 students from UK universities and was judged by representatives from four UK games companies. The industry experts selected the best projects based on technical ability and creativity.

Sheffield Hallam students took first and third place in the Game Technology category, first place in Game Design and Best Team categories, and third place in the Game Art category.

Two of the Sheffield Hallam games are being commercially released through the University's in-house games studio, Steel Minions.

Aspect, a collaborative puzzle game for PlayStation®3, will be released on the PlayStation Network later this year. Redneck Renovator, a destruction-based puzzle game for Android devices, was released on Google Play over the summer.

Dr Jake Habgood, senior lecturer in games development at the University, said: "There are some fantastic opportunities in the games industry, but it's a tough area to break into. Game Republic does a great job of giving students the opportunity to show off their

skills, knowledge and hard work to employers, and I'm really proud of our students' commitment to producing publishable products."

Managing director of Game Republic, Jamie Sefton, said: "The Game Republic Student Showcase is about nurturing talent in this region – an opportunity for final-year students to show their work and be recognised by games companies in Yorkshire.

"The standard of entries was again very high this year, so to win an award demonstrates real passion, skill, talent and dedication, and gives the winning students, including those from Sheffield Hallam, more opportunities to succeed in the games industry."



Inspirational teachers at top of the class

Lecturers from Sheffield Hallam's four faculties have had their teaching recognised at the University's annual Inspirational Teaching Awards.

The award winners were nominated by students from across the University for their commitment to helping students with their studies and their innovative approaches to teaching and learning.

Maths tutor Liz Erett, social work lecturer Jane Foggin and Tim Williams from Sheffield Business School all received an Inspirational Teaching Award for the third year running.

Nominating Liz Erett, one of her students said: "Liz is a great role model, mentor and lecturer. She has supported me through thick and thin – when times were rough, she was always there to support me. She has given me the inspiration to work hard in my final year and reach my potential."

More than 1,500 members of staff at Sheffield Hallam were nominated for this year's awards.

Dr Nick Hodge, principal lecturer in autism was selected by the judging panel to win the Inspirational Research Supervisor award this year. He said: "To win an award was totally unexpected and I feel very honoured.

"I am always inspired by my colleagues at Sheffield Hallam, and I know what fantastic support they all give to students. An award for one therefore is really an award for all."

Professor Philip Jones, Vice-Chancellor of Sheffield Hallam, said: "High quality teaching, and the impact that this has on the future lives of our students, is what our University was established to achieve.

"An Inspirational Teaching Award is a wonderful accolade, for the winners and every single member of staff who received a nomination from one, or many, of their own students. I hope they are as proud of their success as we are of them."

Sheffield Hallam's welfare reform researchers have once again shone a light on the chronic social and economic divides across the UK, with reports that show contrasting fortunes for ex-coalfield communities and seaside resorts.



Getting the scoop on the social divide

By Laurie Harvey

Researchers at the University's Centre for Regional Economic and Social Research (CRESR) have been busy with several pieces of research in recent months.

In a report released 30 years to the day since the 'Battle of Orgreave' during the miners' strike they have found that former coalfield areas are still struggling to rebuild their fractured communities.

In conjunction with the Coalfields Regeneration Trust, academics published a hard-hitting report called *The State Of The Coalfields* in June, which looked at regeneration in the former coal-mining communities.

In the years since the 1984-85 miners' strike, almost all of Britain's coal mines have closed and more than 200,000 coal jobs have been lost. And with Thoresby and Kellingley pits now earmarked for closure, there is just one deep coal-mining pit left in England - Hatfield Main just outside Doncaster.

The University's previous research on the former coalfields has included studies of community relations in the wake of the strike, the rise of 'hidden unemployment', educational attainment in coalfield schools, under-funding by the Lottery and progress in regeneration.

The new report does find some evidence of regeneration, especially in the years before the recession, but for the most part, it is a sobering read. On many indicators, the former coalfields lag badly behind national and regional averages.

Professor Steve Fothergill, who led the research with colleagues Tony Gore and Mike Foden, says: "The miners' strike of 1984/85 may now be receding into history, but the job losses that followed in its wake are still part of the everyday economic reality of most mining communities.

"The consequences are still all too visible in statistics on jobs, unemployment, welfare benefits and health.

"The evidence provides a compelling case that most of the coalfield communities of England, Scotland and Wales still require support."

Peter McNestry, Chair of the Coalfields Regeneration Trust says: "This report really brings home the scale of the deprivation that has been faced by 5.5 million people - more than Scotland's total population. What's more, these coalfields communities have had to endure this for well over a quarter of a century.

"The tough reality for coalfields residents is that these problems will not go away overnight."

The report was officially launched in Westminster to a group of MPs representing former coalfields communities.

In their second report, CRESR were back in the headlines with research that paints a more positive picture for English and Welsh seaside communities. It shows encouraging signs that business is booming in many coastal towns whose economies have been able to grow, despite the so-called 'age of austerity', with many reporting increases in jobs.

According to their figures, the British seaside tourist industry remains in remarkably good health, despite fears that the recession and subsequent squeeze on household incomes would lead to fewer people taking holidays.

Instead, the evidence shows the number of jobs supported by seaside tourism has continued to grow, estimating that, averaged across the year as a whole, more than 200,000 jobs in England and Wales are directly supported by seaside tourism. It's an industry that employs more people than the motor industry, aerospace, pharmaceuticals or steel.

Blackpool retains the biggest single concentration of seaside tourism jobs - nearly 16,000 - followed closely by Brighton and Bournemouth. In all, 63 resorts around the coast of England and Wales each have at least 1,000 jobs directly supported by tourism.

But the report also shows that some places are faring better than others. Despite rosy results for many resorts in the south of England, in a number of other places, including Blackpool, limited incomes and spending by visitors appear to have choked growth.

Professor Fothergill, co-author of the report with Professor Tina Beatty, says: "Over the last few years there has been plenty of media discussion about the rise of 'staycations' - holidays in Britain rather than abroad - but so far little hard evidence.

"Our figures show that so far the British seaside tourist industry has weathered the age of austerity very well indeed.

"The survival of a large seaside tourist industry should be good news, not just for most seaside towns but also for UK plc."

Peter Hampson, Chief Executive of British Destinations, which represents local authorities and tourist bodies, says: "The British seaside tourist industry has too often been written off as a relic of the past, and assumed to be on the same downward trajectory as so many other famous British industries.

"Anyone familiar with the resorts themselves knows this was always a myth, and I'm delighted that the new figures from Sheffield Hallam expose the truth.

"Our seaside resorts still face challenges in adapting to changing tastes and travel patterns, but with the right support from Government this is an industry that should have a bright future as well as an illustrious past."

Once again, the team at CRESR have highlighted the stark contrast between places undergoing economic growth and the many traditional working-class heartlands, particularly in the North, that continue to suffer.



Food Festival springs to life

Sheffield Food Festival moved to May this year as it ventured onto the Moor for the first time. Despite wet weather, thousands of visitors attended the event, which is run by the University and Sheffield City Council. Organisers used the festival to promote the new MEng food engineering degree, which students can only study at Sheffield Hallam and seeks to develop the next generation of engineers for the UK's massive food and drink industry. Other highlights included a stunning launch night in the Peace Gardens with live music, organised by Sheffield Hallam student Oliver Murton, a beer festival and several pop-up restaurants, with masterclasses by local Great British Bake Off star Howard Middleton and Si Ayres from the Showroom.

University launches MOOC to fight cancer

Sheffield Hallam has joined the fight against one of the UK's biggest cancer killers by launching its first Massive Open Online Course (MOOC) in Enhancing Prostate Cancer Care. In collaboration with Prostate Cancer UK the MOOC has been designed to give healthcare professionals, patients, carers as well as those with an interest in the disease, the chance to become an expert in prostate cancer care. The five-week programme will be delivered via discussion forums and live webinars with Sheffield Hallam academics, medical specialists and guest speakers provided by Prostate Cancer UK. Registration is now open for the free course which will start on 13 October 2014. It will be the first time the University has introduced a MOOC to its extensive course offering. David Eddy, MOOC course leader and principal lecturer in radiotherapy and oncology at Sheffield Hallam, said: "This is a first for Sheffield Hallam and Prostate Cancer UK. It is designed to support and enable people across the country and outside the UK, to study or improve their knowledge about prostate cancer care."

The new Executive MBA

The University has relaunched its MBA offer for 2014, with a new programme that has been designed to develop the leaders and managers of the future. The new MBA programme combines professional skills development with real-world experience and personalised coaching. It ensures students gain the skills and knowledge to become the agile and resilient business leaders of the future. The programme has been approved by the Chartered Management Institute (CMI), so when students graduate they are eligible for chartered manager status. The flexible programme can be tailored around a student's needs depending on the sector in which they work. And specific routes are available in psychology, education and built environment, providing tailored programmes around the needs of managers and leaders in specific sectors. Several professional bodies in these sectors have also approved and accredited the new courses. The programme has been designed using the latest leadership techniques to create managers fit for 21st century business success. It reflects the complexity and changing nature of modern business and the need for leaders to develop 'emotional capital' (EQ), a key competency for successful leadership.

More information about the new MBA programme is available at www.shu.ac.uk/mba



Student race team on the right track

A team of Sheffield Hallam students returned to Silverstone in July to join the race to be crowned Formula Student Champions 2014. Formula Student is the world's largest motor sport event for student-built race cars. With nearly 3,000 students competing, Sheffield Hallam's SHU Racing team were up against some of the best engineering colleges and universities in the world. The team, consisting of 19 students from a variety of academic backgrounds, contributed to the creation of the car that they worked for almost a year to design and build. However, despite all their hard work, an engine failure meant the car had to retire to the pit garage before the final race around the Silverstone circuit. English literature student Sophie Felon is part of the SHU Racing business team and was one of the 280 women taking part in the competition this year - the highest number in Formula Student history. Sophie said: "We were competing against some very established teams and some very talented engineers. We tried our very best and despite all the problems we had, we're proud with our result."



Helping nurses return to practice

A new course has been launched to attract former nurses back into the profession. The Return to Practice scheme is a part-time course that prepares for the re-registration of nurses who have been out of practice for up to 10 years. Run by Sheffield Hallam together with Sheffield Teaching Hospitals the course looks at current practice, legislation and policies, record keeping and safeguarding. Students will also be able to redevelop their clinical skills and their specialist knowledge to update their learning in line with healthcare guidelines. Joanne Benn, deputy head of nursing and midwifery at Sheffield Hallam, said: "According to the Centre for Workforce Intelligence, the NHS is likely to have 47,500 fewer nurses than it needs by 2016. We are aware of the challenges employers face when it comes to planning and sustaining the future nursing workforce at a time of financial constraint which is why we are introducing this new course." The course starts in February 2015.

Public health research debate

Renowned journalist and Guardian columnist Polly Toynbee recently led a debate on the power of research on public health at Sheffield Hallam. Discussing the future of public health in the UK, Polly's visit to the University marked the launch of a new book on health inequality, co-authored by a team of Sheffield Hallam experts. Health And Inequality: Applying public health research to policy and practice looks at the impact of health inequality on vulnerable infants and parents, breast-feeding and teenage mothers and mothers and babies in prison.

Dr Julia Hirst, a reader in sociology co-edited the book alongside Professor Angela Tod of the University's Centre for Health and Social Care Research. Julia said: "We have reflected on ways forward for public health in the future and have considered activities and interventions that have sought to minimise the health divide in the UK over recent years."

Ethical hacking conference

Computer science experts at the University held a conference in June to explore ethical hacking - the practice of using information security tools to prevent illegal attacks. Dr Neil Richardson, senior lecturer in information and systems security, organised Steelcon, which featured 12 speakers from the computer security industry and academia. Around 140 guests attended the conference in the Cantor Building, attending workshops and talks. There was also a kids' area, with sessions on computer programming, robotics and game-making.

Digital fiction study launches

Is digital fiction changing the way we read? That's the question being posed by Dr Alice Bell and Dr Jen Smith, who are leading a unique study into how readers interact with digital fiction. The new research project includes a vast programme of free public events, starting with a talk by digital multimedia author Kate Pullinger at literary festival Off The Shelf on 12 October. There will also be a series of exhibitions and workshops, which readers can come along to and offer their own opinions on new forms of literature.

The Sheffield Hallam researchers have curated an interactive exhibition at Bank Street Arts, opening on 22 October. 'The Future of Reading? An Exhibition of Digital Literature' will include a range of digital fiction, such as electronic text adventure games, hypertext and hypermedia fictions, flash fictions, kinetic poetry and literary videogames.

To find out more about the project visit www.readingdigitalfiction.com

On 24 June 1916, British artillery unleashed the preliminary bombardment to the Battle of the Somme. Soldiers of the 15th West Yorkshire Regiment (the Leeds Pals) witnessed Armageddon. Guns rumbled and thundered, and the horizon exploded into a sea of flame. At the Somme alone, the British fired 19million shells, 150,000 per day.

The killing fields of the Somme were an industrial battlefield, a testimony to the power of modern industry to manufacture war machines of ferocious destruction.

Military commanders demanded increasing quantities of heavy high explosive shell to batter the German trenches. The nation that could produce the most, and endure the longest, would in all probability win in the end.

The Great War was actually fought by a 'dual army', one in the fields of France and Flanders and one in the workshops of British industry.

On the home front, the men and women of Yorkshire laboured in munitions factories that made the weapons to feed the voracious appetite of the industrial battlefield.

National shell factories were constructed by the Ministry of Munitions at Barnsley, Bradford, Huddersfield, Keighley, Leeds, Rotherham and Hull, producing 715,000 shells by the time of the Battle of the Somme.

Their purpose was to assemble shell components, supplied by an army of local firms with no previous experience of manufacturing war goods. They were operated by management boards, comprised of unpaid local industrial leaders, who installed the machinery, recruited and trained workers, and issued contracts to engineering firms.

Leeds had three national shell factories, employing 4,447 men and 3,730 women. In the 'gallery', shell parts were assembled by an all-women workforce of 532. Women became a regiment of the 'dual army', substituting for the work of men called to the front line. They travelled in regimental style by train to the workshops, and were of a 'superior working class', recruited mainly from the households of skilled artisans.

The working day was intense: until 1917 the factories worked a three-shift system, but then reverted to two-shifts, after a realisation of the huge physical workload imposed on women.

The Industrial Battlefield

By Dr Merv Lewis

To mark the centenary of World War I this year, Sheffield Hallam history lecturer Dr Merv Lewis details the impact of Yorkshire's industry on the battlefields of the Great War.



Sheffield was the home of two large national projectile factories, churning out heavy shell, and managed by Thomas Firth & Co and Hadfield's Ltd. The Firth Factory at Templeborough occupied a 13 acres site, built at a cost of £800,000 and employing 5,500 workers, mainly women. Hadfield's factory at Tinsley occupied 10 acres, costing £900,000 and employing 4,000 workers. Building the factories was a huge task, requiring thousands of machines, electricity generation plant and the construction of feeder railways. By mid-1917, these two factories had produced 570,000 heavy shell – the vital ingredient for the industrial battlefield.

Outside of the national factories, Yorkshire engineering firms were organised by local munitions boards. By early 1916, nearly 500 workshops in Leeds had converted to munitions factories, making shells, gun castings, machine gun mountings, rifles and cartridges.

The Sheffield Munitions Committee organised the local manufacture of war goods, ranging from fuses, gaines, primers, friction tubes, gauges, trench mortars, steel helmets, ammunition boxes, grenades and gun forgings.

War contractors varied from makers of lawn mowers to producers of high-speed-steel, from motor vehicle makers to cutlery manufacturers. Even the University of Sheffield's applied science department became a munitions contractor.

But what of the Leeds Pals who on the 1 July 1916 attacked on the industrial battlefield of the Somme? Sadly, it was a short life – 530 casualties out of 750 attacking, and of these 230 were killed.

Despite the destructive power launched against German forces, they did not buckle. Mass armies were resilient, capable of absorbing a great deal of punishment, as well as dishing it out. The Leeds Pals attacked into no-mans-land only to face machine guns and German artillery, a result of the failure of the British bombardment to destroy the deeply entrenched enemy.

On the Somme, the British were still relatively short of heavy artillery and high explosive shell, and Germany's industrial war machine was superior in heavy guns. At the same time, 25 to 30 per cent of the shells fired during the preliminary bombardment were duds, partly the outcome of the lowering of inspection standards as British industry strived to raise output at all cost.

Yet in the long-run, the army that could produce the most did gain a

The nation that could produce the most, and endure the longest, would in all probability win in the end.

decisive advantage. The scale of the bombardment on the Somme was a sharp reminder to German commanders that they faced a formidable industrial power, and by the late summer of 1918 Germany felt the full blast of Britain's dual army. By that stage, British artillery had far more heavy guns than at the Somme, and in late September had sufficient stocks to fire some 2.5million shells in three days alone.

During the Great War, British artillery launched 168million shells across the industrial battlefields of the Western Front, a reminder that the war was fought between the workers of Britain and Germany as much as by the brave soldiers on all sides who faced the horrors of the industrial battlefield.

M.J. Lewis and Roger Lloyd-Jones, *Arming the Western Front: Business and the State, 1900-1920* will be published later this year.

Sport England funding boost

The University has received a six-figure sum to get more students playing sport and taking part in physical activity sessions. Students at Sheffield Hallam now have more chances to play sport and take part in physical activities, thanks to £173,144 of funding from Sport England's University Sport Activation Fund.



The University is one of 54 universities to benefit from nearly £10 million of funding to help get nearly 180,000 new students playing sport and physical activity. Sport Activation projects focus on those that do not currently play, and help tackle the issue of many young people giving up sport in their late teens and early twenties.

Sheffield Hallam's project targets first and second-year undergraduate students who are not involved in sport clubs and societies, and encourages them to try casual sports. Dan Porter, head of sport services at Sheffield Hallam, said: "Because we have such a successful programme of sports at Sheffield Hallam, we're aiming

for the harder to reach students who drop out of sport early on in their studies. In particular, female students generally participate in less physical activity at university, and play less sport than male students. "But rather than telling people to play more sport, at set times determined by us, we'll be working with them to organise local activities at times that suit them."

Sport Activators at Sheffield Hallam are being trained in motivational interviewing techniques, and they will be aiming to get 4,650 new students playing sport over the next three years.

Preparing coaches for 2016

Sport academics at Sheffield Hallam are helping British coaches prepare the next generation of Olympic talent with a brand new course. The newly developed MSc Advanced Sport Coaching Practice course uses the latest technology, research and academic theory to make sure that professional coaches are equipped to deliver the next generation of British athletes on the world stage.

With its hands-on approach, the course – developed with British Judo and Sportcoach UK – has attracted some high-profile participants, including Toni Minichiello, who coaches Olympic star Jess Ennis-Hill.

Toni Minichiello says, "Coaching is all about learning and being able to apply it to your sport... Once you qualify as a coach, you're pretty much left to your own devices.

"This course gives me an opportunity for structured continued learning, an opportunity to match experience with academic and scientific developments to improve my coaching, and to gain a recognised qualification that adds credibility and objectivity to my experiential learning."

Toni is joined by a number of judo coaches, including Kate Howey, Olympic silver medallist. Kate says, "As a coach you are always looking to learn, and in doing this I am investing in my future in top-level judo coaching."

The course is being run over two years, initially as a postgraduate diploma, with the option of staying on to do a third year to complete the full masters degree.

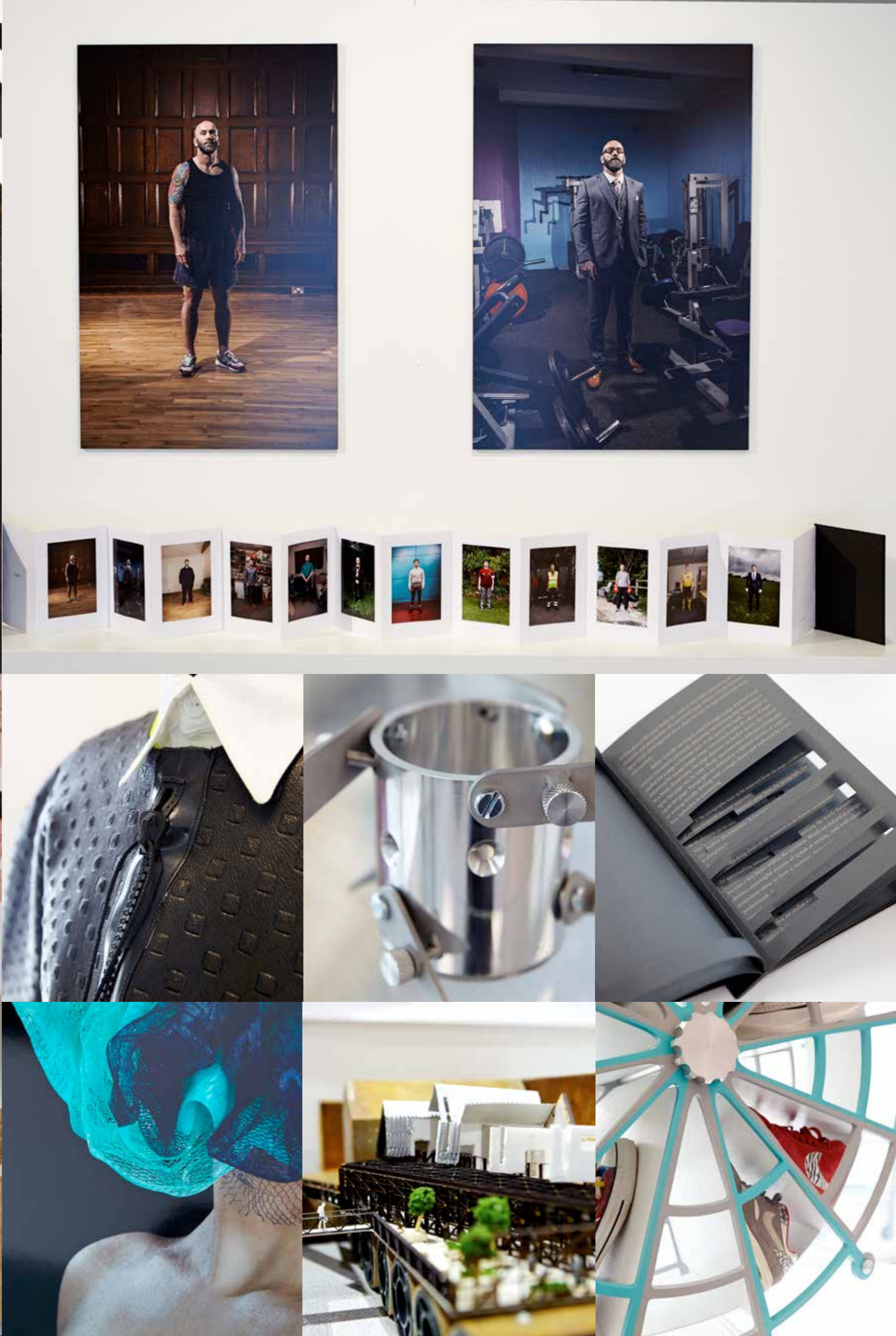
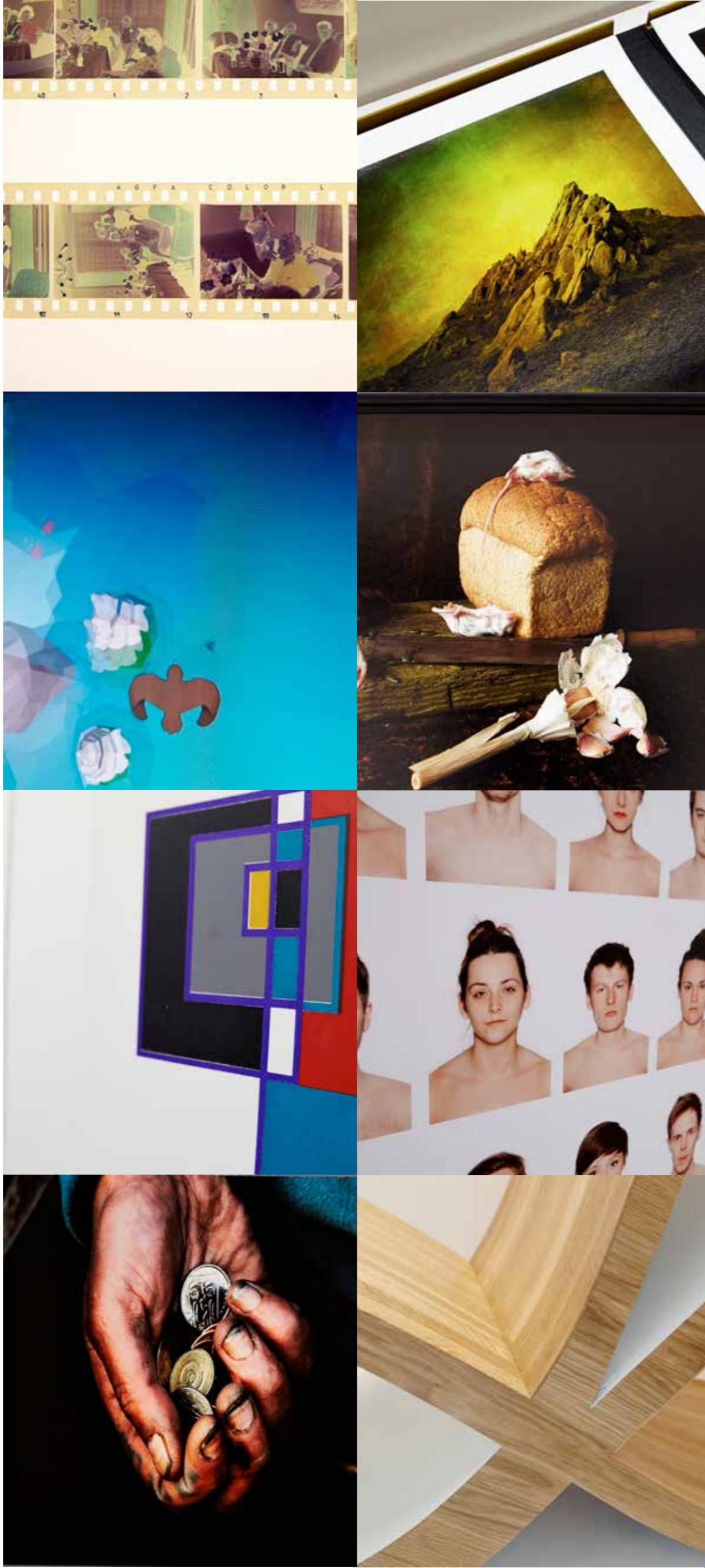
Michelle Vernon-Way, senior lecturer in sport coaching, is the course leader. She said, "This course is an excellent example of a university working with a professional body to make British sport the best it can be.

"We're working closely with British Judo to make sure that we have a clear understanding of the issues facing coaches, and we're getting a great insight into their professional practices and needs.

"We're giving them the skills and knowledge to design, deliver and evaluate specialist coaching programmes, make critical decisions in a complex environment and be outstanding and knowledgeable coaches in their field."



In Pictures: Sheffield Institute of Arts Degree Show



With 170 years of history behind it, the Sheffield Institute of Arts is looking to the future. This year's degree show reflected that, with SIA students from a range of disciplines showing off some incredibly creative work. The annual degree show is one of the biggest student exhibitions in the North, and attracts interest from national industry experts as well as those with an interest in the arts.

