



Swansea University  
Prifysgol Abertawe

Research news from Swansea University  
Issue 33 | Summer 2019

# MOMENTUM

- ▶ Exploring the Social Worlds of Steel
- ▶ The many faces of Tudor England – Swansea research reveals diversity of Henry VIII's sailors
- ▶ Facing the huge issue of artificial river barriers



# IN THIS ISSUE

Welcome to the summer 2019 issue of *Momentum*.

In 2020, the University will celebrate its centenary. Our lead article reflects on Swansea's development as a research institution, and Professor Gareth Jenkins, Director of Research at Swansea University Medical School, discusses why research is still his passion.

The University is working on research which aims to identify legal and regulatory barriers for the development of autonomous ocean-going vessels. We examine how Swansea University research is helping make 'Smart Ships' a reality for the near future.

Joint research between Swansea University and the University of Hamburg has found that nanoclusters of metal atoms – such as gold and silver – have properties which mean they can be used as semiconductors. Semiconductors are at the heart of modern electronics meaning that the team's efforts could pave the way for a variety of new applications.

Also in this issue, we focus on research that is raising awareness of the huge problem of artificial river barriers, and we explore the Social Worlds of Steel.

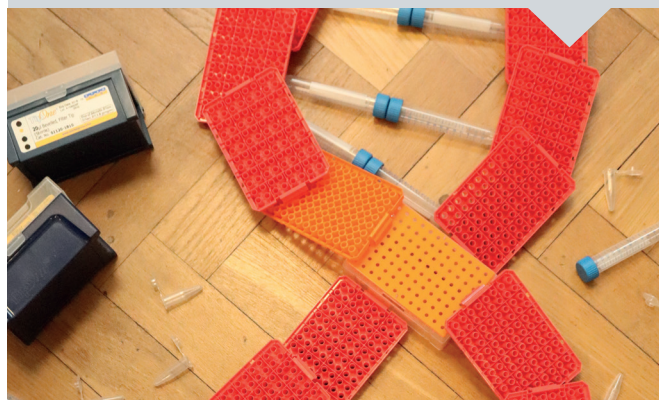
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## ON THE COVER



'Micro-Molecular Plastics' submitted by PhD student Chloe Robinson for the Swansea University Research as Art Competition 2018.

Chloe created this image to illustrate the use of plastics used in research institutions. She explains: "As a molecular ecology PhD student, plastic is part of my everyday research life: plastic tips, plastic tubes and plastic storage boxes. The nature of DNA research requires sterile consumables and hardy, chemical-proof containers, and the answer is always to use plastic. This image shows the amount of plastic pollution I produce on a weekly basis working in the laboratory. Despite some of this being eligible for recycling, most plastics in research are single-use, highlighting how molecular ecology research has a long way to go before it is environmentally-friendly."

# 03



### A PASSION FOR RESEARCH

# 04



### NEWS ROUND-UP

# 06



### SWANSEA UNIVERSITY COLLABORATES WITH GE HEALTHCARE

# 08



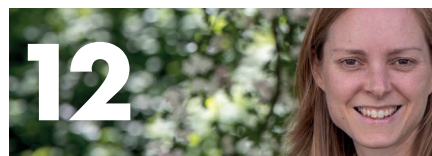
### RESEARCH NEWS

# 10



### NEW RESEARCH

# 12



### YOUNG RESEARCHERS - CERYN EVANS

# A PASSION FOR RESEARCH

Next year marks 100 years of Swansea University and a century of developing research that makes a difference to people's lives. The University opened in 1920 with Chairs in areas including metallurgy, physics, chemistry, geology and history. Health has been a significant area of research at the University for decades, with expertise situated in the Institute of Health Care Studies. The University's Medical School was established in 2001.

Professor Gareth Jenkins has seen many developments at the University, having started here as a PhD student in 1993. Now Director of Research at Swansea University Medical School, he has also just published his 100th paper on seminal research which details how in the future, oesophageal cancer could be diagnosed with a £30 blood test.

Professor Jenkins said: "Many researchers will produce more than 100 papers during their careers but I thought it was a nice coincidence that my 100th paper came out as Swansea University prepares to celebrate its own centenary in 2020."

The University has many landmarks to celebrate in 2020. In 1921, for example, Dr Mary Williams was appointed Professor of French Language and Literature, becoming one of the UK's first female professors. Other outstanding figures from the University's history include Kingsley Amis who wrote one of the first campus novels, *Lucky Jim*, while lecturing in English at Swansea; and Professor Olgierd Zienkiewicz who pioneered the finite element analysis method in civil engineering.

More recently, the University has been at the forefront of projects such as the Bloodhound Supersonic Car, and involved with research including the creation of the first artificial lung.

Professor Jenkins said: "I started out at Swansea investigating DNA mutations for my PhD. The thrust of my career to date has been trying to develop new ways of measuring those DNA mutations."

Professor Jenkins' work plays a key role in maintaining the University's reputation, especially as it prepares for the Research Excellence Framework (REF) 2021.

In the REF 2014 Swansea University was ranked 23rd in the UK and the Medical school was ranked 2nd in Unit of Assessment 3, for the quality of its research. Some of that success is down to research into mutations carried out by Professor Jenkins and his colleagues, including Professor Shareen Doak who leads the University's In Vitro Toxicology Group. Together they have been at the forefront of work to develop lab-grown human cells to use when studying whether test compounds cause mutations and their link to cancer. This work aims to study mutation in human models rather than use animals for testing.

As one of the pioneers of the University's Medical School, Professor Jenkins is delighted to have played a part in its



Professor Gareth Jenkins

remarkable growth and now has an office in the ILS building he helped to design.

"After I completed my doctorate I considered leaving Swansea but the Medical School was about to start and I could see this was going to be a big development with great opportunities for future research," he said.

"When I was a PhD student in the Genetics department at Swansea there were 20 of us, now the Medical School has 200 PhD students. It has seen enormous growth in a relatively short space of time and we're proud we can provide great opportunities for research."

As the University approaches its centenary, and prepares for REF 2021, scope for producing research with real future impact is growing. In the Hillary Rodham Clinton School of Law, for example, LegalTech Wales has become a hub for the digital revolution that is transforming legal service delivery, and the University has just completed the building of its £35 million Institute for Innovative Materials, Processing and Numerical Technologies (IMPACT).

For Professor Jenkins, it always has been, and always will be, the research, and an endless passion for innovation and discovery, that forms the essence of a University: "Research is all about being open-minded. You can't plan very far ahead, you have to go where the scientific interest takes you. Although my role in the Medical School has changed, my enthusiasm for the research is still the same. The thought of coming in and seeing the students and what their latest experiments show – that's what brings me to work in the morning."



## NEWS ROUND-UP

# UNIVERSITY EXPERTISE TO HELP IMPROVE LEGAL OUTCOMES FOR CHILDREN AND FAMILIES



A major new project will draw on the expertise and infrastructure of Swansea University's SAIL (Secure Anonymised Information Linkage) Databank to provide much-needed information about the family justice system in England and Wales, to help support best possible outcomes for children and families.

The project, run jointly between the SAIL Databank at Swansea University Medical School and Lancaster University, has been awarded a grant of £2.2m from the Nuffield Foundation to create the data partnership at the heart of the Nuffield Family Justice Observatory (Nuffield FJO).

The four-and-a-half-year project will combine the infrastructure and technical expertise of the SAIL Databank with the leading family justice research capability at Lancaster University to provide a vast source of data to improve understanding of how the family justice system is performing and how it could be improved.

The SAIL Databank, which holds billions of anonymised person-based records, is an internationally acclaimed data repository dedicated to providing a safe and trusted means of harnessing population-scaled data to increase the quality and quantity of research, and support better policymaking, practice and citizen wellbeing.

The data partnership will be a vital component of the Nuffield FJO's operation, enabling analysis and linkage of existing datasets, as well as providing training and support for researchers and analysts.

Professor David Ford, Co-Director of the Nuffield FJO data partnership and Director of the SAIL Databank, will lead the Swansea side of the project. He said: "The infrastructure and expertise in the new Nuffield Family Justice Observatory data partnership will, at last, make it possible to develop really vital understanding about how the justice system supports children and whether it can be improved.

Linking together data from across the justice system and beyond will, for pretty much the first time, allow researchers to shed light on topics which have been largely invisible to practitioners and policymakers to date."

With the support of the ESRC-funded ADR Wales (Administrative Data Research Wales) this major new project will see the SAIL Databank host the valuable administrative data held by Cafcass (Children and Family Court Advisory and Support Service) in England and Cafcass Cymru in Wales, making the data fully accessible to the researchers of the UK.



# DOUBLE AWARD FOR INTERNATIONAL RELATIONS LECTURER

Dr Dennis R Schmidt, lecturer in international relations at Swansea University has been awarded both a British Academy Grant and a Texas Collaboration Fund Award, for a new research project focusing on the ethics and politics of international criminal justice. Dr Schmidt said: "The broad theme - which ties the grant and award together - is 'crime and punishment in international society' that is, why, how and when international society punishes certain violations of law eg genocide, crimes against humanity and war crimes."

The 2019 Texas Collaboration Fund Award worth £1500, is for joint research with The University of Texas at Austin School of Law and Rice University, and will focus on international criminal law institutions. Dr Schmidt has met with international lawyers and international relations scholars at both institutions to explore and discuss aspects of the project.

Dr Schmidt also recently gave a lecture at The University of Texas at Austin. The lecture, entitled The Syria Air Strikes: Towards a New Doctrine of "Humanitarian Reprisal" focused on the different dimensions (law, ethics, and politics) involved in justifying the use of force in international affairs.

The British Academy Grant, worth £7200, will support research on a particular form of international criminal justice institutions, namely hybrid courts. Dr Schmidt explained: "These courts are hybrid, because they combine international and domestic law, staff and funding structures. I will be travelling to Cambodia, Sierra Leone and The Hague in order to conduct interviews with judges, lawyers and court staff with the aim of gaining insights about the relationship between the domestic and the international within those courts."



Dr Dennis R Schmidt



'Smart ships' are expected to be operational by 2030

## THE LEGALITIES BEHIND SMART SHIPS

The Institute of International Shipping and Trade Law (IISTL) is currently working on a research project, which aims to identify legal and regulatory barriers for the development of autonomous ocean-going vessels. Currently, several IT and engineering companies are working towards developing such vessels, which will have on-board systems to undertake all the operational decisions independently without intervention of a human operator.

'Smart ships' are also on the agenda of the International Maritime Organisation (IMO) and it is expected that vessels that can navigate with the aid of artificial intelligence will be in operation by 2030. The members of the IISTL convened with researchers from Dalian Maritime University, China, in November 2018 in a Research Workshop to exchange ideas on the subject. Also, several members of the IISTL were involved in the delivery of a Conference in Istanbul on "Unmanned Ships- Liability and Insurance Issues" organised in collaboration with Koc University, Istanbul. A monograph, the first in this area, written by Swansea University Professors Simon Baughen, Baris Soyer and Andrew Tettenborn, and Associate Professors Georgios Leloudas and Dr Youri Van Logchem, will be published in 2020 by Hart Publishing.



## FEATURE

# SWANSEA UNIVERSITY COLLABORATES WITH GE HEALTHCARE TO CHARACTERISE AND DEVELOP ANTI-CANCER THERAPIES

Four years of collaboration between Swansea University and GE Healthcare has advanced the treatment of ovarian cancer by allowing detailed analysis of drugs designed to target the disease.

Antibody-drug conjugates, or ADCs, are an important class of highly-potent biopharmaceutical drugs designed as a targeted therapy for the treatment of people with cancer.

Dr Gareth Healey from Swansea University Medical School explained: "Characterising the behaviour of antibodies is crucial to understanding their therapeutic potential. Our research has shown that traditional approaches to developing antibodies for use as ADCs, don't capture enough information about how an antibody will perform further down the development pipeline. This often leads to extensively researched antibodies failing before reaching the clinical stage which is both time consuming and not cost effective."

The collaboration with GE Healthcare began in 2015 with GE Healthcare providing advanced analysis equipment called a Biacore™ T200, which measures binding interactions between molecules, allowing researchers at Swansea to perform fast and detailed analysis of ADCs.

Dr Healey continued: "With Biacore technology, we were able to fully characterise the binding behaviour of the antibodies and gain understanding of why certain antibodies worked well, whilst others didn't.

Besides helping to develop potent antibodies for our current ADCs, this information and the techniques developed will help improve the development of future ADCs to ensure only the most suitable antibodies are selected."

The successful research has led to a new, ERDF-funded collaboration between GE

Healthcare and Swansea University (as well as four other partners – Porvair, GSK, Bruker and Axis). The Cluster for Epigenomics and ADC therapeutics (CEAT) at Swansea University is seeking to further develop ADCs targeting proteins that are over-expressed on ovarian cancer cells.

In addition to access to Biacore technology, GE Healthcare will provide support on the use of its IN Cell Analyser. This is an automated high throughput imaging microscopy system that will be used to find out if the selected antibodies can internalise (move into the cell), which is a critical aspect of ADC function.

Tim Fagge, European Business Development Manager from GE Healthcare, said: "The close-knit relationship between GE Healthcare and Swansea University has generated excellent results so far, including peer-reviewed published research. By continuing to work closely with Swansea University as part of the CEAT project, GE Healthcare hopes to play a vital role together with our partners to advance ADCs to clinical phases where patients will directly benefit from the work we're doing. Increasing access to innovative next generation therapies such as ADCs has the potential to target oncological diseases more precisely and when combined with chemo and radiotherapy treatments will deliver better outcomes for patients."

Swansea University's Professor Deyarina Gonzalez, Principal Investigator on the project, said: "Swansea University has had access to essential equipment and training on two cutting-edge pieces of technology developed by GE Healthcare. The Biacore™ T200 instrument and the IN Cell analyser have enabled the team here to streamline the development of a class of much-needed ovarian cancer therapeutics, which could make a huge difference to the lives of ovarian cancer sufferers and their families."





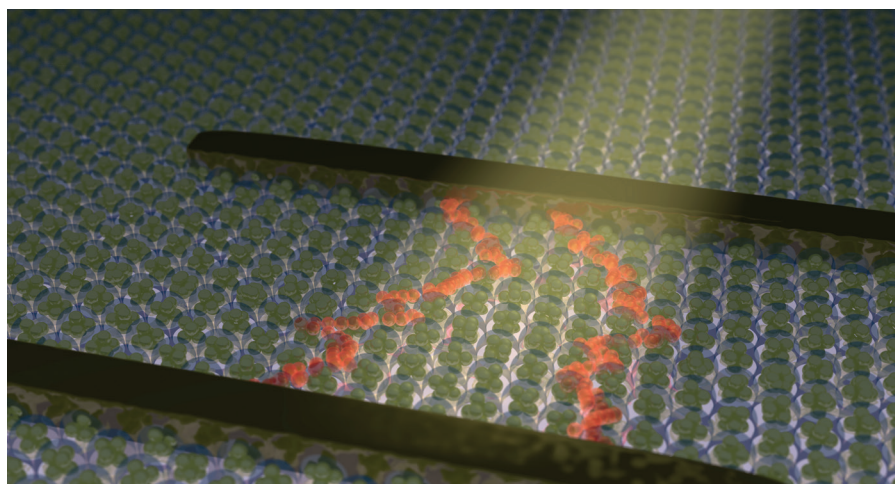
CEAT Post-doctoral researchers Emenike Onyido and Zoe Coombes working on GE's Biacore T200.

## FEATURE





## NEW RESEARCH



Pictured: light strikes the films of nanoclusters promoting the charge flow between the two electrodes.  
Credit: Galchenko/Klinke, University of Hamburg/Swansea University.

## METAL NANOCLUSTERS CAN BE USED AS SEMICONDUCTORS: KEY PROPERTIES OBSERVED FOR FIRST TIME

Tiny nanoclusters of metal atoms – such as gold and silver – have properties which mean they can be used as semiconductors, a joint Swansea-Hamburg research team has discovered.

Semiconductors are at the heart of modern electronics. Amongst their many uses are in display devices for mobile phones and televisions, light detectors, and solar cells for providing energy.

The two main types of particle-based semiconductors already in use are colloidal quantum dots and organic semiconductors. These materials are at the nanoscale. Their tiny size means they are subject to a phenomenon known as quantum confinement, which causes changes to their optical and electronic properties. These changes make them suitable for their intended applications.

Metal nanoclusters combine aspects of both

these other materials. Like colloidal quantum dots, they are very stable. Like organic semiconductors, they are atomically precise, or molecular, containing a specific number of atoms in their metallic core.

However, despite containing all the right ingredients, metal nanoclusters had never before been shown to display semiconducting properties.

This is where the Swansea-Hamburg team made the breakthrough.

The team devised a way of making films of nanoclusters consisting of 25 gold atoms (Au<sub>25</sub>). They then observed that the nanoclusters displayed semiconducting properties. Specifically, they observed field effect and photoconductivity in phototransistors made of these films. These unique properties are hallmarks of all semiconducting materials.

The team is made up of researchers from Swansea University's Chemistry department and the University of Hamburg in Germany.

Professor Christian Klinke of Swansea University's Chemistry department explained the potential applications of this finding: "The discovery of semiconducting properties in metal nanoclusters could pave the way for a variety of new applications, from field effect transistors and photodetectors to light emitting diodes and solar cells.

We need to build on this finding and refine the technique further. But this discovery points the way ahead. It shows that we can use metal nanoclusters to produce high quality semiconducting films that are easy to assemble."

The findings were published in the journal, 'Advanced Materials'.

## EXPLORING THE SOCIAL WORLDS OF STEEL

Professor Louise Miskell, from the University's Department of History, has been awarded an 18-month leadership fellowship by the Arts and Humanities Research Council (AHRC) to investigate the transformative impact of the rise of the steel industry in the twentieth century on communities in Wales.

The Social Worlds of Steel project, launched in May this year, will use a range of historical evidence documenting the development of housing, leisure facilities, transport and services in Welsh towns including Shotton, Ebbw Vale, Newport and Port Talbot.

Professor Miskell said: "This research will offer new insights into the characteristics of 'steel towns'.

By the 1960s, more people in Wales were employed in iron and steel than in the coal industry, yet it is still coal that tends to dominate our understanding of industrial communities and the lives of the people who lived in them. In Wales's steel towns, patterns of work, identity and social life developed very differently. By revealing more about this, the project aims to challenge some of the traditional stereotypes of 'industrial Wales'.

A key remit of the AHRC's leadership fellowship scheme is to support projects which combine innovative new research with public engagement activity. The Social Worlds of Steel project, as well as conducting a programme of academic research, includes a collaboration with heritage professionals to investigate ways in which social life in steel towns can be presented to the public in museum displays and exhibitions. The long-term aspiration is to give residents of steel communities, past and present, a greater sense of their place in industrial history."



Professor Louise Miskell



# FACING THE HUGE PROBLEM OF ARTIFICIAL RIVER BARRIERS

The number of artificial river barriers in the UK is hugely underestimated.

A Swansea University project is mapping river barriers throughout Europe, and has found that the number of artificial barriers in existence are hugely underestimated and causing a major threat to river ecosystems.

Based at Swansea University's College of Science, and led by Professor Carlos Garcia de Leaniz, AMBER (Adaptive Management of Barriers in European Rivers) is an EU Horizon 2020 project, which aims to raise awareness of the problems posed by stream fragmentation, the pressures on freshwater ecosystems, and the need for innovative solutions to restore river connectivity.

Dr Joshua Jones is a Postdoctoral Research Officer for the AMBER project. He said: "This is the first time that river fragmentation in Britain has been estimated through a comprehensive assessment, and worryingly, we have

found that only 1% of rivers are free from artificial barriers.

Issues caused by artificial barriers in rivers should be a priority for water authorities as barriers affect the health of river systems and the lives they sustain. For example, important migratory fish such as salmon, eels and sturgeon travel thousands of kilometres each year to reproduce and find food. The high number of river barriers makes it difficult for them to complete their journeys along their normal routes."

## What are artificial river barriers?

*Artificial river barriers are manmade structures such as dams, weirs, tunnels, or culverts, carrying a stream or open drain under a road or railway and other manmade obstacles.*

The AMBER project is using national and institutional databases, as well as citizen science through a mobile app that can be used outdoors to record instances of river barriers. The team are also creating a barrier atlas on a Europe-wide scale with the release of the first map of recorded barriers in EU member state rivers planned for November 2019.

Victoria Hurst is Project Manager at AMBER. She said: "Artificial barriers are one of the main threats to river ecosystems. We're committed to working with hydroelectric companies, water providers, NGOs, anglers and local authorities to ultimately restore river connectivity in a way that maximizes the benefits of water abstraction but reduces environmental impacts."

The barrier tracker app can be downloaded via the App Store and Google Play.



## NEW RESEARCH

### ADDRESSING THE CHALLENGES OF 'OPEN SOURCE' EVIDENCE IN HUMAN RIGHTS CASES

Technology has fundamentally changed human rights investigations in recent years. Whereas investigators in the past were denied access to regions where mass atrocities have occurred, now ordinary citizens can record events in real time and post this 'open source' evidence online. Satellite imagery can also help to identify scenes of destruction, such as the burning of villages.

Professor Yvonne McDermott Rees, of the Hillary Rodham Clinton School of Law, is leading an interdisciplinary team of researchers on the OSR4Rights project, which seeks to examine some of the key

challenges and opportunities posed by the use of open source research for human rights investigations.

Funded by an Economic and Social Research Council (ESRC) Transformative Research grant, OSR4Rights combines expertise from law with computer science, and includes co-investigators from the Universities of California, Berkeley; Essex; Manchester, and Heriot-Watt. Three of the team members first met through the Swansea University project, Challenging Human Environments and Research Impact for a Sustainable and Healthy Digital Economy (Cherish-DE) Crucible.

A project workshop held in Swansea in April 2019 examined the important issue of bias or under-representativeness in open source research. Professor McDermott Rees explained: "While open source research has been heralded for its hugely democratising potential, this workshop examined the impact it may have in inadvertently silencing certain perspectives. For example, a greater reliance on open source research might mean that those who do not have ready

access to technology go unheard, and that particular kinds of violations, such as sexual and gender-based violence, may be under-examined." The workshop was attended by investigators from the United Nations Office of the High Commissioner for Human Rights and international non-profit organisations, including Human Rights Watch and Amnesty International, as well as academics from a wide variety of disciplines and institutions.



Professor Yvonne McDermott Rees

### RESEARCH ACROSS BOUNDARIES

The College of Arts and Humanities at Swansea University has launched a new initiative to bring external and internal staff together. The first Research Across Boundaries interdisciplinary research conference was held on 20-21 May this year. The conference was organised by Professor Jonathan Bradbury, Director of Research within the College of Arts and Humanities, and staff from the (COAH) research office. It featured presentations from all colleges at Swansea University as well as hosting external speakers from Swansea Council, Cardiff and Cardiff Metropolitan Universities, and University College London.

Themes included global challenges, digital applications, and health and wellbeing. Researchers also discussed ideas for interdisciplinary research on a wide range of issues including migration and refugees, trust and Brexit, modern heroes, environmental sustainability, bilingual writers and Welsh history, language, literature and culture. Professor Bradbury said: "This event gave us the opportunity to explore themes in an interdisciplinary setting. From the wealth of representatives present, we were able to gain extraordinary insights. We look forward to making the conference an annual event as part of the College's contribution to the University's Research and Innovation Strategy, which strongly emphasises interdisciplinary research."

### THE MANY FACES OF TUDOR ENGLAND - SWANSEA RESEARCH REVEALS DIVERSITY OF HENRY VIII'S SAILORS

The crew of Henry VIII's sunken flagship Mary Rose included sailors of African, Mediterranean and Middle Eastern origin, according to new research, featured on a Channel 4 documentary, which was initiated at Swansea University.

The extraordinary finding, which came as a surprise to the project team, casts the history of the Tudor period in a new light.

It shows that the men making up the English navy were far more diverse than had previously been thought.

The documentary was screened to mark a major new exhibition at the Mary Rose Museum in Portsmouth. One of the individuals featured is of African origin - a young man whom the programme makers have named Henry.

Henry was between 14 and 18 years old. By analysing oxygen isotopes in his teeth, and levels of sulphur, nitrogen and carbon in his bones,



The crystal, 3D version of Henry's skull



experts can show what his diet was and where he was brought up - in southern England.

However, DNA analysis shows that he was genetically North African, with origins in present-day Morocco or Algeria.

The Mary Rose sank in 1545 in the Solent, during a naval battle with the French, with the loss of hundreds of sailors' lives. The wreck was raised from the seabed in 1982.

Swansea University has been working closely with the Mary Rose Trust for many years, examining the remains of the sailors and the artefacts on board, shedding new light on the lives of a Tudor naval crew.

The recent research involved experts from the Mary Rose Trust and the universities of Cardiff and Portsmouth, as well as Swansea. The roots of this new finding, however, lie in the work of Dr Nick Owen and the team at Swansea University's College of Engineering.

Dr Owen and team established that photogrammetry – a method of producing high definition, photorealistic 3-D images – was a very promising method for visually analysing skulls.

This allowed osteologists – bone specialists - to test how effective digital remains were for analysing skeletons to establish sex and ancestry or identify diseases that the individual suffered from, like rickets and scurvy.

During the analysis of the photogrammetry models, Dr Owen and team, working with Oxford Archaeological Ltd, carried out a detailed study of ten skulls of Mary Rose crew members, chosen at random.

It was during this work that one of the skulls, Henry's, was identified as being of African origin.

In 2016, at the British Science Festival, held in Swansea, they released accurate photogrammetry models of ten human skulls from the Mary Rose as interactive 3D digital resources for academic researchers as well as 3D models of other artefacts from the Mary Rose for viewing by the general public ([www.virtualtudors.org](http://www.virtualtudors.org)).

Dr Nick Owen of Swansea University College of Engineering said: "I'm very proud that this work started in Swansea. The findings show us that a Tudor fighting force was a lot more diverse than we might have imagined.

I have carried out research with the Mary Rose Trust for over seven years. It has been brilliant, and never fails to throw up the unexpected, shedding more light on the amazing lives of Tudor seamen. The Mary Rose collection is truly a research treasure trove."

The Swansea team also created 3D printed copies of several of the skulls, used for facial reconstruction, that feature in the exhibition at the Mary Rose Museum. This includes an exact copy of Henry's skull but

in stunning crystal, which will be one of the highlights of the exhibition.

Further research at Swansea University on the sailors' lives is likely to follow. There are also plans for an exhibition in Swansea of artefacts from the Mary Rose Museum.



A facial reconstruction of Henry, based on analysis of his remains; he was born and raised in southern England, but with North African origins. Image ©The Mary Rose Trust



# CERYN EVANS

Ceryn Evans works in the School of Education within Swansea University's College of Arts and Humanities. Her research explores young people's decisions to pursue pathways alternative to going to university.

"Going to university has become the 'normative' next step for many young people leaving college or school in England and Wales. The majority of 18 year-olds now remain in some form of full-time higher education (HE). There are, however, a minority of young people who, despite having a string of good A-levels or vocational qualifications, decide to embark on pathways other than university. My research aims to understand why, despite being qualified to go to university, some young people choose alternative options. It also seeks to understand which pathways they anticipate taking instead.

I have conducted interviews with a number of young people who were studying for their A-levels or vocational qualifications at Further Education colleges in Wales. These young people invariably had their sights set on beginning apprenticeships or training courses, finding a job or returning to college for more study after completing their current studies.

The interviews revealed the complexity of young people's decisions and the myriad reasons for anticipating a range of alternative pathways. For those hoping to begin apprenticeships, their decisions were bound up with the appeal of earning a living, gaining work experience and guaranteed employment. One young person for example, was an aspiring accountant, and for him an accountancy apprenticeship was highly attractive because it offered him the chance to gain an income alongside training. For others, their sense of self-efficacy, motivation and feelings towards academic work also played a role in their decisions, as did their fears and apprehensions about the pressures of an academic environment associated with university. This was exemplified by two interviewees who had considerable concerns about the academic pressures which they felt university would bring, reflecting their own sense of unease with exams and difficulties with self-motivation.

Why should we be interested in the stories of a relatively modest group of young people? Their narratives tell us something important about the contemporary economic contexts in which young people make decisions. At a time when the labour market has become more congested and competitive, and costs of higher education have escalated, are alternative pathways to employment emerging with growing appeal for young people? What's more, given that different pathways are associated with widely different employment opportunities and life chances, attention to the alternative pathways that some young people take and



## Career path

- ▶ PhD, Cardiff University (Oct 2009 – Sept 2013)
- ▶ Research Assistant, Cardiff University (2013-2015)
- ▶ Research Associate, Cardiff University (2015- 2017)
- ▶ Lecturer: School of Social Sciences, Cardiff University (2017-2018)
- ▶ Lecturer, School of Education, Swansea University, Sept 2018-current

the destinations which these might lead toward, is important for understanding how patterns of social inequality in the UK are (re)produced, reconfigured or disrupted.

So far, I have presented my research to an advisory group whose suggestions and advice will be invaluable for steering the project's future directions. The study has enormous potential to advance long-term policy developments in further and higher education and vocational training and will therefore be valuable to Welsh and UK policy makers."