



University of  
Reading

Doctoral and  
Researcher College

# DOCTORAL RESEARCH

Highlights 2023



# WELCOME

**Welcome to our 2023 Research Highlights**, giving a brief snapshot of some of the excellent research and community engagement work from our highly talented doctoral research students. Our doctoral researchers are drawn from diverse backgrounds and cultures, spanning over 100 countries, which creates a rich environment. I am continually surprised at the remarkable breadth of their research.



**PROFESSOR  
ADRIAN WILLIAMS**  
DEAN OF  
POSTGRADUATE  
RESEARCH STUDIES  
AND RESEARCHER  
DEVELOPMENT

This year, we have examples showing that we are not afraid to investigate difficult subjects, such as sexual exploitation and abuse perpetrated by United Nations peacekeepers and the role of piracy in the creation of the British Empire. Global research is also evident in research to understand the impact of roadkill on wildlife in Latin America and the impact of space weather on our technological infrastructure, both in orbit and on Earth. We also delve into history to show how new texts, arriving in England from the twelfth century from the Islamic world, caused a medical revolution in the understanding of mental illness.

We also showcase two of my favourite events of the year: the annual Fairbrother Lecture and the Doctoral Research Conference. The 2023 Fairbrother Lecture explored the use of surveillance cameras – both public and private – and how they impact the rights of the individual. Our annual Doctoral Research Conference played to a packed lecture theatre and it was a treat to once again witness the breadth, depth and humour that doctoral researchers presented in their three minute thesis talks, research films, and poetry entries, alongside the many research displays.

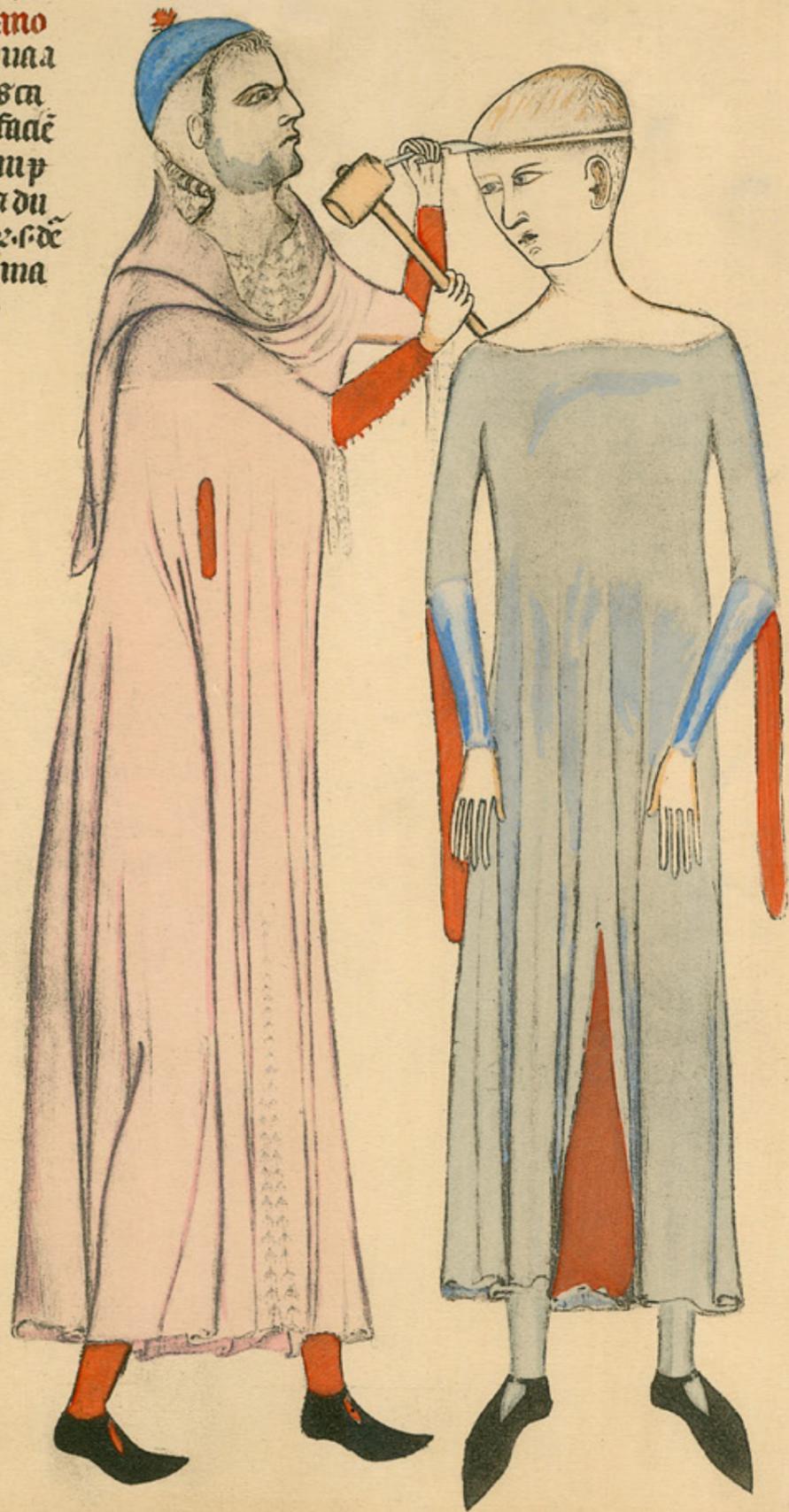
I very much hope that you enjoy reading these highlights.



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## Mental disorder in Medieval England



Such medical beliefs were revolutionised from the twelfth century when advanced, new texts started to arrive from the Islamic world, having been translated into Latin by a monk, Constantine of Africa. Despite their importance in the history of medicine, most of these texts remain untranslated into a modern language. My research has involved translating several of these medieval manuscripts to discover the new ideas they contained.

# ELVES, DEMONS or illness?

Critically, mental disorders were now clearly understood as illness, mainly due to imbalances in one of the four bodily 'humours' (a system of medicine based on four fluids: blood, phlegm, black bile, and red bile). The texts laid out key ideas about the anatomy and physiology of the brain. The English came to understand that the brain, rather than the chest, was the site of cognition; they had a model of how it worked and how it went wrong. 'Disorders of the head' included frenzy, lethargy, apoplexy, and lovesickness, the latter considered a serious illness of obsessive love and desire. Women could also suffer from psychological symptoms due to 'suffocation of the womb'. We would recognise much that came under the heading of 'melancholy', but this encompassed not only depression, but also anxiety, delusions, and hallucinations.

Doctoral researcher, Anne Jeavons, details how new texts from the Islamic world arriving in England from the twelfth century caused a medical revolution.

**How we understand mental illness has concerned humans since the beginning of civilisation. My research begins with ideas in England during the Anglo-Saxon period, when**

**mental disturbances were not always associated with the brain – the mind was believed to be located in the heart or breast. Surviving medical texts in Old English indicate that patients could suffer from gewitlest ('witlessness'), be ungemynde (insane), or have a weden heorte (literally 'mad heart'). However, many disorders were attributed to supernatural forces such as demons and elves – Abbot Aelfric of Winchester wrote that 'to have a devil in you' was the same as to be mad.**

**In the texts translated we would recognise much that came under the heading of melancholy:**

*'The universal signs of melancholy are fear and sadness and severe tension. Some fear death, others desire it, some laugh a lot, others weep, some kill themselves, others wish themselves to be gone, thinking they are good for nothing.'*

Ideas about mental disorders and their treatment have always changed and developed. The eleventh-century texts I translated are witnesses to a time of evolution in ideas about these conditions. Medicine was becoming a naturalistic enterprise, if not yet a science. Although demons were still considered real – and a cause of illness – they were a matter for the church, not for medicine.

DOCTORAL RESEARCHER, ANNE JEAVONS.

# WOLF IN SHEEP'S CLOTHING



**“When peacekeepers exploit the vulnerability of the people they have been sent to protect, it is a fundamental betrayal of trust. When the international community fails to care for the victims or to hold the perpetrators to account, that betrayal is compounded.”<sup>1</sup>”**

## Sexual exploitation in UN peacekeeping

**My research concerns sexual exploitation and abuse perpetrated by aid workers affiliated with large international non-governmental organisations (INGOs), such as Oxfam, and specifically how policy in this area can be reconciled with enforcement.**

In the summer of 2023, I was selected to be a Political Affairs Intern in the United Nations' Office of the Victims Rights Advocate, an office set up in 2017 as

context in which the perpetrators have been sent to serve, rather than harm, the communities they offend against.

The UN has taken strides to address this behaviour, including a zero-tolerance policy against sexual exploitation and abuse by UN peacekeepers.<sup>3</sup> However, complexities relating to UN peacekeepers' legal immunity means there is no viable mechanism through which the rights of access to redress can

elsewhere, and undertook substantive work which contextualised the depths and complexities of seeking justice for victims. This experience highlighted the need for legal research on sexual abuse in the sector to go beyond simply having victims' rights to redress in mind, and instead to prioritise tangible and tailored support to victims. In this way, the placement shifted the emphasis of my research, which previously focused solely on using the law to incentivise alterations in the conduct of INGOs.

Mia Wick (Law PhD Student) describes how a United Nations (UN) placement shifted the course of her doctoral research.

be guaranteed for victims/survivors. The Victims' Rights Advocate, supported by a small staff, works to facilitate tangible, victim-centred and

This placement was offered through the ESRC-funded Southeast Network for Social Sciences (SeNSS) doctoral training partnership and with the support of the University of Reading.

part of the UN's effort to address sexual exploitation and abuse in which UN peacekeepers have been implicated.

Early allegations of this misconduct stemmed from Cambodia and Bosnia in the early 1990s, while recent and widespread allegations have surfaced in the Central African Republic and the Democratic Republic of the Congo<sup>2</sup>. Whilst any sexual exploitation and abuse causes significant damage to survivors, these occurrences within the aid sector are particularly serious given the vulnerability of those affected and the

gender-sensitive support for victims of abuse, including the facilitation of paternity and child maintenance claims. Their efforts represent a shift in the UN's approach to addressing sexual exploitation and abuse that goes above and beyond simply acknowledging and making top-down policy.

The placement represented an invaluable opportunity for the development of my ongoing research. I gained access to a network of individuals with expertise in tackling abuse, beyond that which I could gain

<sup>1</sup> Marie Deschamps, Hassan B Jallow, Yasmin Sooka, 'Taking Action on Sexual Exploitation and Abuse By Peacekeepers: Report of an Independent Review on Sexual Exploitation and Abuse by International Peacekeeping Forces in the Central African Republic' (2015) accessed via <<https://www.humanrightsvoices.org/assets/attachments/documents/12.17.2015.carpanel.Independent-Review-Report.pdf>>

<sup>2</sup> See United Nations High Commissioner for Refugees and Save the Children UK, Sexual Violence and Exploitation: The Experience of Refugee Children in Liberia, Guinea and Sierra Leone (January 2002) accessed via <<https://www.parliament.uk/globalassets/documents/commons-committees/international-development/2002-Report-of-sexual-exploitation-and-abuse-Save-the-Children.pdf>>; The UK House of Commons, International Development Committee, Sexual exploitation and abuse in the aid sector: Eight Report of Session 2017–2019 (2018) accessed via <<https://publications.parliament.uk/pa/cm/cm201719/cmselect/cmintdev/840/840.pdf>> pp 9–10

<sup>3</sup> UN Secretary-General, Bulletin on Special Measures for Protection from Sexual Exploitation and Sexual Abuse UN Doc. ST/SGB/2003 (9 October 2003)

# SOLAR STORM FORECASTS

We think about the weather a lot; how warm it will be today and whether or not we will need an umbrella. However, there is another type of weather that affects modern life on Earth – and it originates from the Sun. Changing conditions in the space surrounding Earth lead to space weather. This has a range of impacts, particularly on technological infrastructure, both in orbit and on Earth.

**Due to the high temperature of the Sun and the coldness of space, the Sun's outer atmosphere, comprised of charged particles, constantly flows out into space. This is known as the 'solar wind' and it can travel at speeds ranging from 250 to over 800 kilometres per second. Depending on where the solar wind originates from on the Sun's surface, it can have a structure of fast and slow streams. This structure rotates with the Sun to fill the solar system in three dimensions. Variations in the solar wind can be a source of space weather.**

Another source of space weather, particularly severe space weather, are eruptions from the Sun's atmosphere, known as coronal mass ejections (CMEs). These are eruptions of huge amounts of solar material that travel outwards into space and can sometimes be directed at Earth. The speed and arrival time of CMEs at Earth is affected by the solar wind conditions.

The aurora (also known as the Northern or Southern Lights) is the most visible impact of space weather, which can be brighter, or seen at lower latitudes, during a space weather event. Space weather can also damage our technology, leading to satellite failures, damage to power grids and disruption to communication

systems. Therefore, it is important to forecast space weather to allow any impacts to be mitigated. To do that, we need to have an accurate knowledge of the solar wind.

My research aims to improve the accuracy of forecasts of severe space weather by improving solar wind forecasting. To achieve this, I have used a technique that has greatly improved terrestrial weather forecasting over the past 20 years and applied it to the solar wind. This technique is called data assimilation (DA) and it combines computer simulations with actual measurements of the solar wind taken from spacecraft to produce forecasts. These DA forecasts have been shown

to be a significant improvement over forecasts produced by computer simulations alone. This is the first time that such a study has been conducted, proving promising for the future of solar wind forecasting.

The European Space Agency will launch the Vigil spacecraft in the late 2020s to a position trailing Earth in its orbit. It will carry several instruments built at UK-based institutions to observe potentially hazardous space weather. As part of my research, I have evaluated how well measurements from the Vigil spacecraft could improve solar wind forecasting. As well as providing a side-on view of any Earth-directed CMEs, the space mission will allow us

to measure the solar wind that will later arrive at Earth. These measurements can then be used to produce more accurate solar wind forecasts using DA.

It is hoped that the unique position of Vigil will allow us to increase forecast accuracy and warning time, enhancing our ability to prepare for, and mitigate against, space weather events.

HARRIET TURNER IS A DOCTORAL RESEARCHER IN THE DEPARTMENT OF METEOROLOGY.

*Harriet Turner, Mathew J Owens, Matthew Simon Lang, et al. Solar wind data assimilation in an operational context: Use of near-real-time data and the forecast value of an L5 monitor. ESS Open Archive. <https://www.doi.org/10.1029/2023SW003457>*

# CROSSBONES



## Piracy and early imperial advancement

Doctoral researcher Luke Walters (History) describes how piracy facilitated Britain's early imperial ambitions, and how pirates were unexpected participants in the creation of empire.

In popular culture, pirates have been distinctively characterised as the banes of colonial governments but, in reality, pirates abetted imperial advancement to an unprecedented and unexpected degree.

For as long as mankind has sailed the seas, there have been pirates. The term piracy largely refers to the practice of robbery at sea, though this definition has evolved over the enterprise's long and bloody history. For instance, although Sir Francis Drake was employed as a privateer on behalf of Elizabeth I, many historians continue to denounce him as a pirate, despite his legitimate commission. It was in the early modern period (1500-1700s) that piracy attained its now iconic status.

### The rise of Anglo piracy

By the mid 1690s, Britain had reached a precarious peace with the Mughal Empire and the days of 'heroic' (in this case Christian and patriotic British sailors) pirates such as Drake were all but finished. Tempted by lucrative trade networks in the Indian Ocean, Britain now looked to imperial advancement. With new trade came new addictions, as the wealthy now enjoyed previously unobtainable exotic and lavish amenities. So, Anglo pirates turned their attentions eastward. Thomas Tew, the 'Rhode Island Pirate' was one such enterprising individual who plundered a haul worth £100,000 in 1693. By 1695, dozens of Anglo pirate companies stalked the Indian Ocean, many of them financed by prominent colonial administrators.

### Banes of Empire

Drawn by the promise of gold and a loathing of Britain's imperial ambitions, colonial governors in British colonies sought to remain semi-autonomous, preferring to seek profit in their own dominions rather than take part in the establishment's imperial ambitions,

which in their eyes seemed a world away. Many of these officials offered dubious privateering commissions to pirate crews under the pretence of harassing enemy trade, though it cannot be ascertained whether they were wholly aware of the pirates' motives. Tew, for instance, was sponsored by the Governor of New York, Benjamin Fletcher, who directly profited from Tew's piracy. Under Fletcher's administration, New York gained a reputation as a pirate haven – and so Britain decided to intervene.

### Abettors of imperial advancement

In September 1695, Henry Avery, the so-called 'King of Pirates', seized the Ganj-i-Sawai, a wealthy pilgrim ship belonging to the Mughal Emperor Aurangzeb. This event forever altered the way in which the state dealt with pirates. The month after its capture, colonial administrator Edward Randolph reported to the Board of Trade on the ways in which colonial governors broke the regulations of the imperially inclined Navigation Acts. As such, Fletcher was subject to a list of 18 charges brought against him in 1698, with no less than 12 of these implicating him in the facilitation of piracy.

In their terrorising of the trade routes, pirates brought the ocean into a space subject to the politics of competing empires. Control of the space was as much a product of piratical activity as it was of empire, and pirates were integrally involved in building imperial authority. In response to piratical raids, global oceanic development reconstructed the seas, changing them from lawless frontier into distinctive legal spaces. This transformation was ushered in by some of history's most notorious pirates.

LUKE WALTERS IS A PHD RESEARCHER IN HISTORY, EXPLORING THE SOCIO-POLITICAL AND CULTURAL ASPECTS OF EARLY MODERN PIRACY, PRIVATEERING, AND MARITIME PREDATION.

# Behind

**Automatic facial recognition technology is increasingly used by both public and private sector organisations to manage and police public spaces. While public sector surveillance must be justified by the public interest, the private sector is able to use facial recognition on the much broader grounds of preventing and detecting unlawful acts.**

The scope of this surveillance is ambiguous, as the prevention of unlawful acts can extend beyond criminal acts and extend a business's commercial interests through the exclusion of individuals who do not conform to expectations. For example, one private body deploying facial recognition may seek to 'recognise habitual thieves and troublemakers'. This introduces uncertainties as to what type of 'troublemakers'<sup>2</sup> are deemed troublesome enough to be placed on a watchlist. To complicate matters, we are often unaware of crossing thresholds into spaces where surveillance is privately controlled and what this means for our privacy and data rights.

The journey from being nominated to presenting the Fairbrother involved three months of planning and developing the lecture. The most important part of the development process was creating a narrative that was accessible to a non-

specialist audience. There are lots of ways to approach describing this research, and thinking through the best way to tell the story was central to the creative process. We settled on a storytelling approach that hinged on real-world examples of automatic facial recognition based on how people encounter this technology in their daily lives. This allowed technical concepts, such as the legal distinctions between public police and private security, to be illustrated by walking the audience through how they operate in practice. I included stories based on real locations and took the audience on a journey in which they encountered the technology

One year later, the deployment of facial recognition is just as relevant, with the Home Office introducing plans for images shared by high street retailers to be run through facial recognition software.<sup>3</sup> The Home Office is also encouraging police to access and compare suspect images with those contained on UK passport<sup>4</sup> and driving licence databases<sup>5</sup>. In addition, we are set to see an apparent deregulation of surveillance networks with the present draft of the Data Protection and Digital Information Bill seeking to remove the independent regulatory role of the Surveillance Camera Commissioner.<sup>6</sup>

In March 2023, I had the honour of presenting my research to members of the public at the annual Fairbrother Lecture. This lecture, entitled *Behind Electric Eyes – Facial Recognition Surveillance in Public Spaces*, discussed how automatic facial recognition deployment impacts our human rights, data rights, and equality rights in public spaces.<sup>1</sup>

at different points, operating in different ways and with different potential consequences. This had the benefit of being relatable to the audience as the narrative progressed through real-world locations such as a local shop, a train station, and a public high street. I was well supported by the Doctoral and Researcher College and my supervisors in this creative journey.

In the run-up to the talk, I had the opportunity to be involved with public engagement activities, including appearing on local radio and speaking to a journalist from a national newspaper. These experiences challenged and helped develop my abilities to articulate and negotiate the framing of information to ensure the story was accurate and fairly communicated to the public.

With these developments in mind, I hope that the Fairbrother Lecture provided the audience with important insights into this complex and ever-changing field, which allows them to critically reflect upon these changes. Throughout the experience of preparing the lecture, I often took time to reflect and appreciate the opportunity. I will always be grateful for this chance to promote new understandings and challenge current narratives, which is what my research has always strived towards.

DOCTORAL RESEARCHER WILLIAM PAGE (LAW) REFLECTS ON HIS EXPERIENCE OF PRESENTING THE ONLY UNIVERSITY OF READING PUBLIC LECTURE DELIVERED BY A PHD STUDENT.

Watch the full lecture: [www.youtube.com/watch?v=cs9Cn\\_AfIMI](https://www.youtube.com/watch?v=cs9Cn_AfIMI)

<sup>1</sup> University of Reading, 'Smile! You're on CCTV: Fairbrother Lecture preview (University of Reading blog, 28 February 2023) <<https://www.reading.ac.uk/news/2023/University-News/Smile-youre-on-CCTV---Fairbrother-Lecture-Preview>> (accessed 29th April 2023)

<sup>2</sup> Facewatch Testimonials, 'Why we use Facewatch? - Simon Lawrence discusses Covid, security and the future', (Simon Lawrence, Facewatch Website, 28th October 2020) <<https://www.facewatch.co.uk/2020/10/28/why-we-use-facewatch-simon-lawrence-discusses-covid-security-and-the-future/>> (accessed 24th July 2023)

<sup>3</sup> National Police Chiefs Council, 'Partnership to crack down on shoplifting', (National Police Chiefs Council, 23rd October 2023) <<https://news.npcc.police.uk/releases/partnership-to-crack-down-on-shoplifting/>> (accessed 26th October 2023)

<sup>4</sup> Tom Singleton, 'Police access to passport photos 'risks public trust'', (BBC News, 5th October 2023) <<https://www.bbc.com/news/technology-67004576>> (accessed 6th October 2023)

<sup>5</sup> Daniel Boffey, 'Police to be able to run face recognition searches on 50m driving licence holders', (The Guardian, 20th December 2023) <<https://www.theguardian.com/technology/2023/dec/20/police-to-be-able-to-run-face-recognition-searches-on-50m-driving-licence-holders>> (accessed 21st December 2023)

<sup>6</sup> Data Protection and Digital Information Bill, Section 148 (1) <<https://bills.parliament.uk/publications/53287/documents/4126>> (accessed 25th January 2024)



BY ZABOU

# ELECTRIC EYES



**The evolution of venoms has resulted in a plethora of toxins with diverse specificity and efficacy to affect a range of normal bodily processes in the target organisms. While the whole venoms might kill, the individual toxins can be isolated from the venoms, and modified to produce efficacious therapeutics with minimal side effects.**

# Beyond THE STING

**Scorpion venoms  
as emerging  
anti-thrombotic  
drugs**

The blood clotting system is a common target for the convergent evolution of venom toxins, making it a promising avenue to develop venom-derived therapeutics. Research into the therapeutic potential of venoms has primarily focused on the medically significant snakes. There are over 200,000 venomous species, the majority of which are invertebrates. However, invertebrate venoms have been almost entirely neglected. Until recently, invertebrate venoms were inaccessible to researchers due to their low venom yields and the unavailability of such animals. Advances in high throughput screening and venom extraction techniques have allowed the therapeutic potential of these venoms to be explored as powerful resources for bioprospecting. Each venom can contain as many as 1,000 different components, making an estimated 20 million venom components available for bioprospecting.

The effects of arachnid venoms on blood have been very poorly characterised to date. In my research, 30 arachnid venoms, consisting of three scorpions and 27 tarantulas, were screened to determine their effects on blood clotting. Two of the scorpion venoms inhibited platelet aggregation, and extended whole blood clotting time, showing potential for developing an anti-thrombotic drug. Protein purification techniques were used to separate the components of the venoms. These purified fractions were then screened for their inhibition of agonist-induced platelet activation. Two fractions from each venom were highlighted because of their potent

anticoagulant effects. We are currently using mass spectrometry to identify the constituents within these fractions. Following the successful identification of molecules, they will be synthetically reproduced. These processes allow for the mass production of venom-derived compounds and the manipulation of their structure, improving stability and efficacy. This can help produce safer and more efficacious venom-derived therapeutics with no, or minimal, side effects.

The potential applications of this research could be the development of novel anti-thrombotic therapeutics, helping to treat patients with blood clotting disorders such as coronary heart disease, stroke, and deep vein thrombosis. While current anti-thrombotic treatments such as heparin, warfarin and aspirin are highly effective at reducing the risk of blood clots, they are not selective, are poorly tolerated by many patients, and induce undesirable side effects. This means that larger doses are required, and side effects are common. These drugs are typically only effective for short-term use, with efficacy diminishing from prolonged use.

While the research is still in its early phases, it shows great potential due to its high level of efficacy in inhibiting platelet activation and blood clot formation, while not affecting the viability of red blood cells.

JARRED WILLIAMS IS A PHD RESEARCHER IN THE SCHOOL OF PHARMACY AND IS FUNDED BY A MEDICAL RESEARCH COUNCIL, INTERNATIONAL TOXICOLOGY TRAINING PARTNERSHIP STUDENTSHIP.

Venom is often associated with death and misfortune; however, venoms can be repurposed to develop pharmaceutical drugs as medical treatments or diagnostic tools.



# LINKED LEGACIES

## Cultural heritage, forensic technology and human rights

**Heritage is cherished in museums, studied, and converted into touristic sites and sources of economic growth. A product of inspiration, it further inspires and renews human endeavour, driving evolution and knowledge-based development.**

Yet, cultural heritage is also a contested land: illegally excavated, trafficked, and sold for enormous profit in market states. Archaeologists, heritage experts, legal scholars and criminologists demonstrate multiple damages through illicit trafficking causes: irreversibly destroying archaeological context, violating source country's legislation, and having implications in money laundering, organised crime, arms and drugs trafficking, and terrorism.

data acquired through surveying and interviewing 42 law enforcement practitioners from 21 countries. The data identified that forensic technology, physically applied at source, can act as an efficient deterrent on the market side, providing evidence of provenance, enhancing traceability, increasing risk and certainty of being caught, and invisibly guarding objects along the trafficking chain, with unanimous support for its wider implementation. We hope that the published results will trigger wider employment of forensic technology to protect heritage in Iraq and other looting-affected countries.

Cultural heritage is an expression of human genius and human endeavour, a shape given to our most sacred human thoughts, aspirations, and emotions, spanning the centuries.

My PhD focuses on the under-researched negative impact of illicit trafficking on people and communities where cultural heritage belongs and whose ancestors created it. The first article of my PhD series, "Forensic Traceable Liquid for Detering Trafficking in Cultural Property: Pilot Implementation

in Iraq", published by Journal of Field Archaeology, aims to mitigate that damage by introducing and reviewing forensic traceable liquid technology as a potential deterrent for illegal trade. The technology was implemented in Iraq within a project supported by the Cultural Protection Fund, administered by the British Council, protecting over 573,000 archaeological objects in five museums across Iraq by specifically-developed invisible forensic solution. Following this pilot implementation, my study aimed to reveal the potential crime deterrence effect of this technology on the illegal market, based on empirical

My ongoing research focuses on crime deterrence strategies for illegal antiquities trade, heritage education in Iraq, decolonisation of narratives surrounding antiquities trade and, most importantly, human rights implications. The common denominator and main objective of this research, converging towards my PhD paper series, is to inject a timely human rights dimension within the academic, legislative, and policy debate on trafficking in cultural property, empowering peoples' right to culture and the evolutionary knowledge-based development it inspires.

ALESIA KOUSH IS A PHD RESEARCHER IN THE SCHOOL OF ARCHAEOLOGY, GEOGRAPHY AND ENVIRONMENTAL SCIENCE (SPONSORED IN PART BY CENTER FOR ANCIENT MEDITERRANEAN AND NEAR EASTERN STUDIES (CAMNES), ITALY)

*Alesia Koush. Forensic Traceable Liquid for Detering Trafficking in Cultural Property: Pilot Implementation in Iraq. ESS Open Archive <https://www.tandfonline.com/doi/full/10.1080/00934690.2023.2291237>*



**Working-class writer,  
Eco-socialist and Pioneer**

# ETHEL CARNIE HOLDSWORTH

The early twentieth-century writer, Ethel Carnie Holdsworth, was a rare example of a female, working-class, published novelist, who wrote from a section of society which had rarely had a voice.

**A mill girl from the age of 11 in a Lancashire textile town, Ethel Carnie Holdsworth (1886-1962) produced an extraordinarily wide-ranging body of work, including poems, a best-selling novel and a rich journalistic output which eloquently reflected the pivotal socio-political issues of her time. She was a fierce social activist, campaigning on poverty, workers' rights, the female right to vote and the fight against fascism.**

A database containing more than 600 individual entries of Carnie Holdsworth's literary output has been created, in collaboration with my cultural art partners, the Pendle Radicals (a Lancashire-based research and creative project), to document her literary output. This database includes her first attempt to get into print in 1900 and her very last published writing in *The Blackburn Times* of the late 1930s.

Remarkably, despite her prolific writing, when Carnie Holdsworth died in 1962, her work had become almost entirely lost to posterity. My PhD aims to bring it back to public attention by focusing on

the socialist convictions which drove her to fight for a fair and democratic society. Carnie Holdsworth's literary work was informed by her strong socialist beliefs, which were greatly influenced by the American Romanticists, particularly Walt Whitman. British ethical socialists saw within Whitman's pantheistic nature writing a new model of society based on the socialist principles of comradeship, equality, and inclusivity. This new socialist movement expected to launch a new order of humanity, through a 'back-to-the-earth' kinship between humans and the natural world.

Much of Carnie Holdsworth's writing on nature reflects this ethos and intersects with the present day debate on climate change. In her 'green' writing, such as 1917's *Helen of Four Gates*, Carnie Holdsworth gestured towards an ancient, nature-based belief system, holding it up as an example of an alternative to an industrialised, capital-based model of society which devalued and commodified nature. Today, many environmental thinkers consider that scientific and technological advances can only go so far in addressing the current climate

crisis and that a shift in dominant western models is necessary to achieve the change required to prevent climate catastrophe. President of Brazil, Luiz Inacio Lula da Silva and President of COP26, Alok Sharma, have highlighted the importance of people who adhere to belief systems, similar to those touched upon in Carnie Holdsworth's writings, in which there is a sustainable and democratic reciprocity between the human and natural world, such as the Indigenous communities of Aboriginal Australia and the South American Amazon region.

Carnie Holdsworth's century old writing is still pioneering. Her vision of a free and fair society between both humans and non-humans is as important now at a time of accelerating climate change as it was then.

JENNY HARPER'S PHD IS SUPPORTED BY A SOUTH, WEST AND WALES DOCTORAL TRAINING PARTNERSHIP IN COLLABORATION WITH THE LANCASHIRE-BASED PENDLE RADICALS





**Latin America, one of the most biodiverse regions on Earth, is already transected by around 3.5 million kilometres of roads and plans for future road developments will only increase this value. Research on the impact of animal collisions with road traffic is scarce or lacking in many Latin American countries, thereby hindering effective conservation efforts to prevent roadkill.**

My PhD aimed to fill this knowledge gap, mapping how collisions with road traffic in Latin America threaten the survival of many species of birds and mammals. As a first step, I gathered data from 85 studies conducted across Latin America that had identified 346 birds and 159 mammal species as roadkill. This represents around 10% of all birds and mammal species in Latin America. Using statistical modelling, I identified the characteristics which made some animals more vulnerable to road mortality than others. This analysis revealed that mortality is

higher for larger birds, medium-sized mammals, animals that reproduce fast (those that become sexually mature young and produce lots of offspring at once), those that are more locally abundant and species that have a more generalist diet and habitat preference.

Further statistical modelling allowed me to predict roadkill rates across all Latin America; matching predictions of risk with road maps and information on species conservation status, I was able to identify areas and species for which

conservation and mitigation actions should be prioritised to prevent roadkill. My results predicted that the building of new roads in the Amazon could be devastating, as this area is occupied by many species vulnerable to roadkill, with sloths and anteaters particularly at risk. More research is urgently needed across diverse areas including Southern Mexico and Chile, which have extensive road networks. Vulnerable species including sloths, armadillos, cuckoos, nightjars, vultures, and pelicans are at risk unless road impact mitigation measures are introduced.

# THE IMPACT OF ROADKILL ON WILDLIFE

The following phases of my research focused on my home country of Ecuador. First, I aimed to investigate if roadkill is influenced by the type of land cover, for example, forests, agricultural land and human settlements found adjacent to the road. For six months I regularly searched for carcasses of wild vertebrates across

Millions of animals are killed on roads worldwide each year, making it one of the primary human causes of wildlife mortality.

240 kilometres of roads in the Ecuadorian Amazon. During that time, I mapped 1,125 road-killed animals, representing 149 species of birds, mammals, amphibians, and reptiles. Mapping revealed 'hotspots' of mortality on sections of

straight roads near rivers; cars are likely to drive faster and animals may be more abundant as they come to find water. I proposed that these areas could benefit from mitigation measures, such as lower speed limits and animal crossing signs to reduce roadkill. While counting dead animals for months on end was not a conservation biologist's dream, this survey not only provided important scientific information but led me to discover several specimens that may be new species. I am now working to formally describe and name these species.

Although successful, the survey required a lot of time and energy. As such, to expand my research across the whole of Ecuador, I founded the Ecuadorian Network for Monitoring Roadkill (REMFA). This citizen science project aims to engage the public in documenting roadkill incidents and raise awareness about the adverse effects of roads on wildlife. Combining data from REMFA with available data from the scientific literature, I generated a database of 5,010 roadkill records from 454 species in Ecuador. This allowed me to identify some species and areas that require further attention. For example, mitigation measures may need to be introduced to protect 15 species currently threatened with extinction and to reduce mortality in the iconic Galápagos islands where roadkill rates are very high and many endemic and unique species exist.

I hope my research and ongoing work on conservation and road ecology will provide useful knowledge and guidance for policy and decision-makers to promote a more sustainable road network to protect vulnerable species from road traffic collisions.

PABLO MEDRANO-VIZCAÍNO OBTAINED HIS PHD IN BIOLOGICAL SCIENCES IN MARCH 2023 AND IS CURRENTLY A POSTDOCTORAL RESEARCHER AT THE SPANISH NATIONAL RESEARCH COUNCIL.

You can read more about his research at [researchgate.net/profile/Pablo-Medrano-Vizcaino](https://www.researchgate.net/profile/Pablo-Medrano-Vizcaino)



# Doctoral Research CONFERENCE 2023

**On 14 June 2023, our community gathered for the annual Doctoral Research Conference (DRC) to celebrate the excellence and diversity in doctoral research at the University.**

We enjoyed two inspiring keynote presentations on research integrity from Dr Etienne Roesch, Institutional Lead for Open and Reproducible Research, University of Reading and research communication from Pete Castle, External Communications and Public Relations Manager, University of Reading.

Doctoral researchers delivered a range of presentations and took part in an array of competitions including student-made films, research posters, and research image and object exhibitions, amongst others. It was a fascinating and engaging afternoon, providing an opportunity to gain an appreciation of the wonderful things doctoral researchers are working on across their wide range of disciplines.

You can view a highlights film of the 2023 DRC and see the list of competition winners at [reading.ac.uk/drc2023](http://reading.ac.uk/drc2023). The full DRC film can be viewed on Blackboard.

**Save the date:** This year's DRC will take place on 12 June 2024.



## Three Minute Thesis Competition

Beverly Jennings (Institute of Education) beat off competition from seven other finalists to win the ever-popular Three Minute Thesis Competition with her talk entitled 'Should students read more books by dead white men?'



## Research for a Better World

The Research for a Better World Competition was won by Marta O'Brien (School of Archaeology, Geography and Environmental Science) for her work on air pollution and its impact on children's health in Reading.



## Poetry, Rhyme and Rap Competition

The Poetry, Rhyme and Rap Competition was won by Hongyan Zhang (Institute of Education) for her moving poem on homesickness.



## Research Film Competition

A short film portraying an autistic auto-ethnographic walk, submitted by Jane Elizabeth Bennett (School of the Built Environment), won the Research Film Competition.



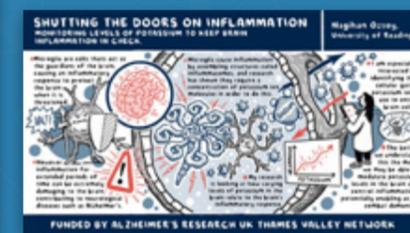
## Research Image Competition

The Research Image Competition was won by Peter Moore (School of Archaeology, Geography and Environmental Sciences) for his image of a deposit of alder wood on a trowel.



## Research Life in Pictures Competition

Kimberly Perry (School of Biological Sciences) won the Research Life in Pictures Competition for her entry 'The Art of Multi-tasking'. Her entry consisted of a collection of images showing various processes within her PhD research.



## Research Poster Competition

Naghian Ozsoy (School of Chemistry, Food and Pharmacy) won the Research Poster Competition with a 'freestyle' designed poster entitled 'Shutting the doors on inflammation'.



## Research in an Object Competition

A replica of Captain Oates' sleeping bag won the Research In an Object Competition. The sleeping bag was handmade by Henrietta Hamant (School of Archaeology, Geography and Environmental Sciences).



Doctoral and  
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