50TH ANNIVERSARY
KENT RESEARCH: MAKING A DIFFERENCE
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INTRODUCTION

The University of Kent was founded 50 years ago and research has been an important part of its mission from the outset. The University’s researchers have always made a difference to Kent, the UK, the EU and worldwide.

This publication features a selection of our many research projects. I have recently joined the University and am impressed by the breadth, depth and impact of our research. I invite you to discover this by reading some of the summaries, or all of them. Find out how those with autism can benefit from drama, or how the study of a Polish theatre practitioner received a *Times Higher Education* award. Discover how comedy can break taboos about illness, or how a study of rendition led to a debate in the Scottish Parliament.
Our research has clarified ethics in healthcare. We are helping to improve adult social care. An award-winning centre improves the lives of people with intellectual and developmental disabilities. We present several cases of progress in pharmaceuticals. The UK Government has used Kent research on paying for social care. We have a better understanding of how wealthy donors make decisions. Our research in biometrics is making the world a safer place. Kent research is transforming heritage management. Our research on global sustainability comes from architecture, anthropology, engineering, business and law.

I hope that this diverse collection of high-impact research will stimulate us all to learn more, to research and experiment. The University of Kent is ready to help you make a difference over the next 50 years.

Professor Philippe De Wilde
Pro-Vice-Chancellor Research & Innovation
Imagining Autism
School of Arts: Professor Nicola Shaughnessy, Dr Melissa Trimingham, Dr Julie Beadle-Brown, Dr David Wilkinson

Research at Kent is helping children with autism to communicate more effectively. Working with children aged seven to 12, the study aimed to encourage language development, empathy and imagination. It did so by exposing the children to a series of imaginary environments and providing drama and play-based activities (puppetry, physical performance techniques and responsive digital technologies).

During the Imagining Autism project the parents offered many compelling testimonies: “He has gained in his imagination; he is talking more, commenting on everything.” ‘He is identifying emotions, and naming them.’ ‘He gave me a kiss and a cuddle, which is rare.’ ‘He is reasoning things out – we had a conversation for 15 minutes for the first time.’

Many professionals were also surprised by the project’s results. Education and health settings usually focus their efforts on providing children with specific skills such as counting or dressing. In contrast, the project’s environments were highly sensory and child-centred, giving the children creative autonomy as ‘co-producers’ in the activities. And the children displayed significant changes in behaviour.

The National Autistic Society is now training staff in the Imagining Autism approach and the work is being used in health settings including diagnostic services within the NHS.

Stories of migration
School of English: Professor Abdulrazak Gurnah

Abdulrazak Gurnah’s most recent novel, The Last Gift draws on his research into migration. With a focus on how different generations experience displacement, the novel exposes the corrosive power of untold stories, including family secrets.

Gurnah’s previous work narrates the trajectory of British imperialism. His novel Paradise (1994) was shortlisted for the Booker Prize and challenged assumptions about empire, colonialism, migration and diaspora. The novel is now a core text on university courses around the world – helping students at all levels, as well the general reading public, to gain insight into a complex subject.

His work for radio includes contributing a programme for the acclaimed BBC Radio 4 series, A History of the World in 100 Objects, and writing for BBC Radio 3’s The Essay.
Grotowski redrawn

School of Arts: Professor Paul Allain, Dr Pablo Pakula, Dr Giuliano Campo

The British Grotowski Project set out to reassess the work of the Polish theatre practitioner Jerzy Grotowski and his influence on British theatre. For decades, Grotowski’s legacy has been hampered by a lack of textual and audio-visual materials, misconceptions about his oeuvre, and limited access to his ‘living tradition’. Led by Paul Allain (above left), the British Grotowski Project sought to overcome these problems by creating a mixture of scholarly research, practical workshops, academic conferences and exhibitions.

The textual research helped to produce seminal writing, such as Grotowski’s Empty Room, edited by Allain. Workshops focused on developing skills in body and voice work, understanding of ritual practices, and directorial montage. A photographic exhibition held at the National Theatre, London reached a broad public audience, and sessions for schoolteachers and pupils improved understanding of Grotowski’s work.

The project was shortlisted for a Times Higher Education Award for Excellence and Innovation in the Arts. Allain was also awarded a medal for Services to Polish Culture from the Polish government.

Poetry Beyond Text

School of European Culture and Languages: Dr Anna Katharina Schaffner, Dr Kim Knowles, Dr Ulrich Weger

In the innovative project Poetry Beyond Text, academics, artists and poets joined forces to analyse creative works that merge visual elements with poetic text, such as ‘Tower’ by Simon Biggs with Mark Shovman (shown below).

For the project, Kent’s research team combined psychological and literary methodologies to investigate how readers/viewers process the information and respond when a creative work includes both text and image. Drawing on the fields of literary theory, art theory, and experimental psychology, the researchers used methods such as eye-tracking and heatmaps. These were employed to test empirical and literary theories on how people process spatial values when reading ‘visual poems’ and ‘concrete poems’. Examples included poetry by Stéphane Mallarmé, Guillaume Apollinaire, ee cummings, Ian Hamilton Finlay and Eugen Gomringer.

The team’s experiments demonstrated how difficult it is for people to ignore verbal meanings, even while attending to the visual aspects of a text. Published in an academic journal, their findings also fed back into other strands of the project, including the website and a travelling exhibition.
The Evliya Çelebi Way
School of English: Professor Donna Landry

Donna Landry’s research led her on a journey that followed in the hoof-prints of the 17th-century Ottoman writer and traveller, Evliya Çelebi. As part of Landry’s investigation of Turkey’s equestrian traditions, she and other members of the project re-traced a section of Çelebi’s 1671 journey to Mecca on horseback.

Presenting our cultural heritage
School of English: Professor Bernhard Klein, Dr Catherine Richardson

Canterbury Cathedral is now able to share its fragile manuscripts with a wider audience, without any fear of damaging the materials. It does so using touchscreen technology that can simulate the physical experience of handling a document. This unusual project is the result of a close collaboration between Catherine Richardson from the Centre for Medieval and Early Modern Studies (MEMS) and Canterbury Cathedral Archives, as well as Kent’s School of Engineering and Digital Arts, Rouen Library, and the University of Rouen. It is one of many MEMS projects that involve a sustained collaboration with outside organisations.

The research network and joint doctoral programme TEEME (Text and Event in Early Modern Europe), set up by Bernhard Klein, places the emphasis on collaborations across national boundaries. Research takes place in partnership with the heritage sector; for instance, the Before Empire project involved the British Library (UK), the Huntington Library (US), and the National Library (India). TEEME has also enabled students to engage with the heritage sector on placements in cities such as Prague, Porto and Berlin.
Literature and the visual arts

School of European Culture and Languages: Professor Peter Read

The perception of the interplay between art and literature in 20th-century France has been transformed by Peter Read’s research. His books Picasso and Apollinaire: The Persistence of Memory and Guillaume Apollinaire: Correspondance avec les Artistes drew on unpublished archive materials to reveal rich relationships between the poet and the artists of his time. Thanks to Read’s work, Apollinaire’s essential influence on the development of literary and artistic modernism is now more widely acknowledged by scholars.

Read’s demonstration of how visual artists respond to their cultural environment, and to the literary company they keep, has also been influential within the art world. Read has acted as an adviser for two exhibitions at the Centre Pompidou-Metz in France, contributed to international exhibition catalogues, and produced illustrated books, magazine and newspaper articles.

Breaking comedy taboos

School of Arts: Dr Oliver Double

A widespread assumption about stand-up comedy is that emotional pain is one of the few remaining taboos. Yet Oliver Double’s research argues that this need not be the case. In his book Getting the Joke he looked at how a number of comedians (such as Richard Pryor, Andre Vincent and Mark Thomas) tackle traumatic, confessional and disturbing topics. Double (below) showed how this kind of comedy helps to develop rapport, empathy and solidarity between performers and their audiences.

His own show Saint Pancreas put these theoretical ideas into practice. It was a stand-up performance that drew on Double’s own experience of being the parent of two children with type 1 diabetes. The show includes some emotional material, such as the account of his son falling into a coma.

The Guardian described it as ‘a tender and uplifting monologue that’s surprisingly funny’. Feedback from the audience also testified to the success of the show. It increased empathy and enhanced understanding by alluding to the physiological causes of diabetes, its treatment and the impact it has on families.

Since then Double has performed Saint Pancreas at conferences and events aimed at diabetes sufferers, their families and professionals.
Humanism and religion
School of European Culture and Languages: Professor Richard Norman

Unlike the movement often referred to as New Atheism which is hostile to all manifestations of religious belief, Richard Norman’s research into humanism argues for a deeper understanding of both religious belief and humanist thought. He believes this could encourage a more productive debate on issues of morality, highlighting the historical influence of religious traditions as well as the humanist contribution.

Norman is a Vice-President of the British Humanist Association (BHA) and his report The Case for Secularism, published by the BHA, was the centrepiece of a debate in the House of Lords. His work often encourages public awareness of humanist thought through articles, lectures and radio talks.

Radical Distrust
School of English: Professor Caroline Rooney, Dr Nazneen Ahmed

Through a study of literary texts and performance culture, the Radical Distrust programme, led by Caroline Rooney, has provided inspiration in tackling socio-political fractures in the Middle East. Many of the project’s music and drama performances have reached global audiences. For instance, the hip-hop play The Rebel Cell, by Dizraeli and Baba Brinkman, was staged at one of Cairo’s main theatres, and the event was reported on Nile TV with its audience of 350 million.

Rooney’s argument for security policies that are based on trust and cultural awareness has informed political and public debate. Her work has been presented to an All-Party Parliamentary Group on national security, the Ministry of Defence and the Foreign Affairs Select Committee. It has also helped to shape and document cultural activism in the Middle East, and contributed to projects related to human rights.

Creating a contemporary poetry scene
School of English: Professor David Herd, Dr Simon Smith, Nancy Gaffield and Patricia Debney

Inspired by a shared interest in the poetics of the New York School, academics and poets in the Centre for Modern Poetry have created a poetry scene in Canterbury with an international reputation. They founded the festival Sounds New Poetry, attracting world-renowned poets such as Marianne Boruch (USA), Stephen Collis (Canada) and Peter Gizzi (USA), as well as major British poets such as Tony Lopez, Daljit Nagra, Harriet Tarlo and Carol Watts.

The New York School was well known for its collaborative work and, in a similar spirit, the Sounds New Poetry festival was the springboard for several new works, with input from poets and musicians. ‘Rote/Thru’ was written and composed by Simon Smith, David Herd and Jack Hues, while the collaboration between Nancy Gaffield, Patricia Debney and the Common Objects ensemble was broadcast on Radio 3’s Hear and Now. The success of the festival led to the award-winning performance series Free Range, which continues to offer a creative mix of music, film and poetry.
Filmmaker Clio Barnard and researcher Elizabeth Cowie explore the boundaries between ‘reality’ and ‘representation’ in documentary film. They have both produced work that is influencing artistic practice and academic debate.

**The Arbor**

**School of Arts: Clio Barnard**

In Clio Barnard’s film *The Arbor*, actors lip-synched some of the dialogue to the voices of real people – an unusual technique used to raise questions about the aims of documentary film. Can it ever close the gap between ‘reality’ and ‘representation’?

The film explores the life of playwright Andrea Dunbar, and Barnard’s research lasted for several years. She spent time with Dunbar’s family, and in the community where she was raised (the Buttershaw estate in Bradford). Richard Dunbar, Andrea’s nephew, describes how the film-making process enabled the community to have a voice ‘by communicating their words through the film’.

*The Arbor* won 10 national and international awards. The charity Kids Company used it in a presentation to MPs and members of the House of Lords, so the film could reveal, on a visceral level, the effects of abuse, neglect and poverty within communities in the UK. Barnard’s most recent work is the highly-acclaimed film *The Selfish Giant*.

**From theory to practice**

**School of Arts: Professor Elizabeth Cowie**

Elizabeth Cowie’s research centres on how documentary films portray reality – not only in narrow factual terms, but also as art and politically engaged film practice. Documentary film is often referred to as ‘non-fiction’ and yet it shapes our understanding of its recorded reality through specific selections and techniques of editing, camerawork and voiceover. It is a storytelling that engages viewers emotionally, producing a curiosity about the world. However, anxieties about how ‘true’ it can be result in a desire for the real that is always failed by the representation.

Insights gained from Cowie’s research on documentary, aesthetics and spectatorship have been taken up by filmmakers and artists whose own work also seeks to explore complex ideas about art and society, trauma and memory. Her creative dialogues have enriched the work of artist filmmakers Clio Barnard (see left), Milica Tomić, Adam Chodzko and Juan delGado.
Conflict resolution
School of Politics and International Relations: Professor Feargal Cochrane, Professor Hugh Miall, Dr Florian Bieber, Dr Elise Féron, Dr Neophytos Loizides

Kent’s research on conflict resolution has been used to enhance professional training in the field and improve democratic participation in conflict-ridden societies. Miall’s research, produced in partnership with Bradford academics, created a framework for conflict resolution that is one of the most widely referred to in the field.

Féron studied civil society organisations in four European cities, representing communities from Rwanda, Turkey and Kosovo. She found these organisations could play a constructive role in homeland conflicts by using social media, networking and dialogue.

Studies by Bieber, Loizides and Cochrane focused on political representation in societies split by deep ethnic, racial and religious divisions. Inspired by the d’Hondt mechanism, as used in the Northern Ireland Assembly, Loizides and Cochrane drew on innovations that make power-sharing arrangements more durable.

Asia’s missing women
School of Politics and International Relations: Dr Andrea den Boer

Gender imbalances can destabilise societies argues Andrea den Boer’s pioneering research. She demonstrated that a lack of females in society, due to sex-selective practices, could lead to lower prospects for peace, democracy and international security.

The research drew on past and present case-studies to establish a causal link between ‘bare branches’ (males who are denied a stake in societies) and increased violence and insecurity. Effects can include violence against women, high-risk behaviour leading to criminality, riots, rebellions and the potential to threaten state security.

The ‘bare branches’ argument has been highly influential. It has been discussed by journalists, and referred to by organisations such as Oxfam, the Gendercide Awareness Project, and the Organisation for Economic Co-operation and Development (OECD).
**Opposing rendition**

School of Politics and International Relations: Dr Ruth Blakeley

Ruth Blakeley’s research provided detailed evidence of a global system of rendition (illegal prisoner transfers), secret detention and torture. Working with Sam Raphael from Kingston University and Reprieve, a legal action charity, the Rendition Project collated a huge amount of open-source data. This was used to piece together a picture of an international network of secret prisons and torture, initiated by the US Bush administration as part of its ‘war on terror’. It highlighted the possible involvement of many countries across the world, including the UK. In particular, the project’s research revealed that suspicious flights, by aircraft linked to rendition operations, landed in and took off from Scottish airports. Blakeley was able to bring this evidence to the media’s attention, and the international coverage led to a debate in the Scottish Parliament on the use of Scottish airports for rendition, as well as a Scottish police inquiry, which is ongoing.

The Guardian described the Rendition Project as one that ‘sheds unprecedented light on one of the most controversial secret operations of recent years’. The project work – and its open access website – has influenced and informed human rights campaigners, lawyers, journalists and the wider public.

**The sacred in the modern world**

School of European Culture and Languages: Professor Gordon Lynch

Gordon Lynch’s research investigates contemporary visions of the sacred and the profane. In his work, the sacred refers not necessarily to traditional forms of religious belief, but to whatever people collectively experience as unquestionable moral realities.

In articles for the press, blogs for influential websites and online films for use in schools, Lynch has introduced the public to this way of thinking about the sacred and has shown its relevance for making sense of contemporary cases that evoke strong public moral emotion.

These have ranged from the phone hacking scandal in the UK to the murders committed by Anders Behring Breivik. In both cases, these ‘profanations’ prompted reactions of outrage, disgust and the search for restitution and renewed moral solidarity. Lynch’s work on such cases allows public audiences to identify sacred passions in the modern world and gain another perspective on instinctive moral reactions.
Informing drug policy
School of Social Policy, Sociology and Social Research: Professor Alex Stevens

Research on the effects of drug decriminalisation in Portugal by Alex Stevens has shifted the international debate. Stevens’ research, in collaboration with Dr Caitlin Hughes (University of New South Wales), argues that decriminalisation is a viable and non-harmful approach to substance misuse. In addition, his research examined alternatives to imprisonment for drug-dependent offenders. The findings produced new evidence to support the expansion of treatment for such offenders.

Stevens’ work on decriminalisation has made a crucial contribution to evidence-based policy in this contentious area. His study has been widely discussed in the media, referred to by politicians in policy debates, and cited by campaigning NGOs such as Release, as well as institutions such as the Global Commission on Drug Policy, UK Drug Policy Commission and the British Medical Association.

The Porton Down legal case
School of History: Professor Ulf Schmidt

Ulf Schmidt’s international reputation in the history of medicine and medical ethics led him to play a pivotal role in a high-profile legal case between the UK Government and the Porton Down Veterans’ Support Group (PDVSG).

Schmidt’s research revealed that scientists working at Porton Down between c1940-1989 carried out experiments on ‘volunteers’, drawn from service personnel, that contravened codes of medical ethics. He also discovered that the experiments at Porton Down included one of the largest trials of nerve agents ever to be performed, involving over 1,500 subjects. Almost 400 people were exposed to Sarin, known to be highly toxic and potentially lethal.

Schmidt gave expert testimony in a legal case that revealed the Ministry of Defence’s failure to seek informed consent from many of the experimental subjects. Over £10 million was granted in compensation (including legal costs) to about 700 veterans, who received a public apology from the UK Government.
Female sexual offenders

School of Psychology: Professor Theresa Gannon

Theresa Gannon's research showed how the factors causing women to commit sexual offences against children are often different to those that underpin offending by men. Prior to her research, virtually no studies had focused on female offenders' offence style or thinking patterns.

Her findings have made a significant impact on the assessment and treatment of offenders in the UK and internationally. The National Society for the Prevention of Cruelty to Children (NSPCC) has described Gannon's work as 'a clear step forward'. A number of organisations worldwide (including both correctional and non-government organisations) have used the research to inform their training, assessment and treatment practices.

Ethics in healthcare

School of European Culture and Languages: Professor Robin Gill

Drawing on his long-standing research in theology and ethics, Robin Gill has been an important influence on medical ethics and bioethics in the UK. His scholarly research on ethics emphasises the four virtues of compassion, care, faith and humility, as described in his book Health Care and Christian Ethics.

This work informs Gill's participation on a number of medical committees. He has contributed to policy debates on stem cell research and continues to be involved in producing content for the ethical guidance of medical practitioners in the UK.
Evaluating social care

Polygraph testing

School of Psychology: Professor Theresa Gannon, Dr Jane Wood, Dr Afroditi Pina and Dr Eduardo Vasquez

Sexual offenders released on licence make more risk-related disclosures – such as being alone with a child, or going to places where children might be – when they are, or expect to be, connected to a polygraph (commonly known as a lie detector). This increased level of disclosure was demonstrated in a study by forensic psychologists at Kent.

The findings were discussed in the UK Parliament and legislation has now made it mandatory for sexual offenders in England and Wales, particularly high-risk offenders, to be polygraphed as part of their licence conditions.

Evaluating social care

Personal Social Services Research Unit: Professor Ann Netten

Thanks to research at Kent, it is now easier to measure the improvements that social care can provide. A new robust method measures the quality of life for adults in social care by identifying factors such as dignity, control over daily life, safety, personal cleanliness, social participation, occupation, and food and drink. This led to the development of the Adult Social Care Outcomes Toolkit (ASCOT), which the Guardian described as a ‘new and valuable tool that would ‘shake up adult social care’.

Feedback from training has shown that the information gained using ASCOT changes the focus of care work and leads to improvements. It also helps researchers and service providers to judge whether provision is cost-effective. UK councils are making increased use of the toolkit and there has been widespread interest from the international community. ASCOT has been translated into Italian, Danish, Finnish, Austrian and Dutch, and is also being translated into Japanese.
The Feminist Judgments Project
Kent Law School: Professor Rosemary Hunter

The Feminist Judgments Project (FJP) put theory into practice by engaging in a real-world exercise of writing feminist judgments for leading cases in English law. In doing so, the research demonstrated the extent to which women's experiences and concerns continue to be poorly reflected in law.

The FJP was a highly collaborative project, with Rosemary Hunter's research playing a major role in shaping it. The research generated wide interest among judges, legal professionals, NGOs, journalists and the wider public. It has also been used in higher education to provoke students to think critically about judicial decision-making.

Housing reform
Kent Law School: Dr Helen Carr

Building on prior work for the Law Commission, Helen Carr’s research provided the inspiration for major reforms in Welsh housing tenure. Working in collaboration with Professor Dave Cowan (University of Bristol) and Professor Caroline Hunter (University of York), the research provided evidence, inspiration and a legal framework for the new Housing Bill now in place.

Proposals included simplification, uniformity across tenures, and avoiding the diverse layers of housing tenure. It is thought the legislation could affect the lives of approximately half a million tenants and landlords.

Equality in development policy
Kent Law School: Dr Kate Bedford

Kate Bedford’s work has highlighted the limitations of some development policies that address gender and sexuality. For instance, her research raises concerns about recent moves toward development policies that invoke sharing, loving partnerships between men and women. The findings show that these policies can also have the unintended effect of excluding individuals who do not fit this description.

Bedford’s work in partnership with NGOs has shown that sexuality is of greater significance to development practice than was previously assumed. Research commissioned by the United Nations Research Institute for Social Development (UNRISD) enabled her to challenge conventional wisdom and stimulate debate within large development organisations.
The debate on privatisation

Kent Business School: Professor Warwick Funnell, Professor Robert Jupe

If there is a need to protect the public when a privatised organisation fails, then should those services remain in public ownership? Research by Warwick Funnell and Robert Jupe presented new findings – and some challenging questions – about the limits of effective privatisation.

Their co-authored book *In Government We Trust* provided evidence which was used by the UK pressure group, Compass, as it campaigned for changes to policies on privatisation. Their work has been widely covered in the media. It also formed the basis of a debate at the Houses of Parliament, covering issues such as the need for balance between public, private and third sector providers, the dangers of over-simplifying the relationship between state and market, and the importance of modernising rather than ‘marketising’ services.

The psychology of firesetting

School of Psychology: Professor Theresa Gannon, Dr Caoilte Ó Ciardha, Dr Emma Alleyne

Firesetting is a common, costly and tragic offence. Every week, criminal firesetting in the UK causes 65 casualties or deaths and costs over £40 million. Yet, until recently, no standardised offender treatment programme had ever been developed.

Responding to this need, psychologists at Kent conducted a controlled study, which found that firesetters have particular psychological characteristics requiring unique treatment. From this, the team developed the first comprehensive theory of firesetting. A standardised treatment programme was also developed for offenders within mental health services and prisons.

The research is being used in the UK to provide treatment for firesetters in secure establishments and community settings. It is also being used to guide decisions on care, sentence planning and parole. Both the US and Australia have drawn on the research to inform and train their own clinicians.
AN AWARD-WINNING CENTRE

In 2014, the University was awarded the Queen’s Anniversary Prize for the work of the Tizard Centre and its contribution to improving the lives of people with intellectual and developmental disabilities (IDD)

**Living in community settings**

**Tizard Centre: Professor Jim Mansell, Dr Julie Beadle-Brown**

Pioneering research at Kent by the late Jim Mansell and Julie Beadle-Brown has shown that small-scale, dispersed community settings provide the best quality of life for people with intellectual and developmental disabilities (IDD). Evidence demonstrated that this kind of setting is able to improve social networks and friendships, aid adaptive behaviour, improve family satisfaction and enhance choice and autonomy. These benefits are further enhanced when staff employ a style of interaction known as Person-centred Active Support.

The findings of the research have transformed the political and public debate around reducing the reliance on institutional environments for people with IDD. The work has also informed the management of services and improved the lives of people with IDD by changing the practices and attitudes of staff. These positive effects have reached far beyond the UK, extending to Ireland, Central and Eastern Europe, Australia and elsewhere.

**Managing challenging behaviour**

**Tizard Centre: Professor Peter McGill, Professor Glynis Murphy**

Even if most people with intellectual and developmental disabilities (IDD) could be resettled into the community, the established view used to be that those exhibiting challenging or criminal behaviour would have to remain in hospital or prison. However, studies by a Kent team led by Peter McGill and Glynis Murphy contradicted this widely-held belief.

Their research demonstrated that managing challenging behaviour among those with IDD is possible through a combination of resettlement, Positive Behaviour Support, cognitive behavioural treatment and appropriate intervention. These findings have influenced policies and practices, with the researchers serving on Government advisory committees, writing policy documents and delivering training to service providers. The researchers were also involved in the creation of a new UK-based charity, the Challenging Behaviour Foundation.
Preventing genetic disorders

School of Biosciences: Professor Darren Griffin, Professor Alan Handyside

Darren Griffin and Alan Handyside’s research has been used to develop new techniques that are being used in IVF clinics around the world. Applied to families where there is a high risk of genetic disorders, the process – known as ‘karyomapping’ – has helped to ensure births of unaffected children.

The impact of this research has also been extended beyond clinical applications. Adaptations are being translated for use in livestock breeding regimes, to improve meat yields and reduce environmental concerns.
Cellular imaging

Medway School of Pharmacy: Dr Claire Peppiatt-Wildman, Dr Scott Wildman

Through the visualisation of cellular events in live tissue, researchers Claire Peppiatt-Wildman and Scott Wildman have developed new models for investigating kidney and bladder function in states of health and disease. Their findings represent a significant step forward, helping clinicians and physiologists to understand responses to drug-toxicity, and the onset and progression of disease.

The imaging of live bladder tissue, adapted for bedside application, has already altered clinical practice within the NHS. And the technology could help to develop new drugs to treat kidney disease. The research team has established collaborative links with the pharmaceutical company Pfizer and biotechnology company Biogen Idec.

Nanoparticles in drug delivery

Medway School of Pharmacy: Dr Vadim Sumbayev

Research in the emerging area of nanotechnology, has shown that gold nanoparticles may be the key to developing new treatments for diseases such as allergy, leukaemia and autoimmune disorders.

Nanoparticles are so small that they operate on the same scale as biologically active macromolecules, and gold nanoparticles were found to be an excellent platform for drug delivery. With clear potential for therapeutic innovation, these findings led to Vadim Sumbayev’s collaboration with the Institute for Health and Consumer Protection (part of the European Commission Joint Research Centre). The work has inspired further research from companies who specialise in nanotechnology, nanobiotechnology and synthetic biology.

Guide for pharmacologists

Medway School of Pharmacy: Professor Alistair Mathie

The proliferation of drug targets in recent years created the need for a new research resource. Kent researcher Alistair Mathie was one of three contributors who produced the authoritative but user-friendly Guide to Receptors and Channels (GRAC).

In writing the guide, opinions were sought from consultants and experts across the field in order to provide an authoritative consensus. There was also an emphasis on ease of use, so a newcomer to a particular target group could identify the main elements at a glance.

As an academic resource, GRAC receives numerous citations and influences the education of students around the world. It is also having a substantial impact on research in industry. In recognition of its importance, Mathie and his colleagues were awarded the Rang Prize from the British Pharmacological Society.
Development of biopharmaceuticals
Centre for Molecular Processing: Professor Mark Smales

The next generation of drugs – protein based biopharmaceuticals – is set to provide new treatments for a wide range of diseases, with the current market worth more than $100 billion per year. However, development and production is expensive, so even modest increases in yield and product quality can be highly significant.

Research at Kent, led by Mark Smales, has had an impact on the development, production and quality of biotherapeutic protein drugs. Smales has developed technology that can predict the performance of a particular cell line producing these drugs. Thanks to links with biopharmaceutical development and manufacturing companies (in particular, Lonza Biologics), his findings are now being used in industry. The work has helped to provide gains in production, while reducing the overall time and cost of product development.

Reducing neurological disability
School of Psychology: Dr David Wilkinson

A new treatment, developed by research at Kent, can help stroke patients to overcome a debilitating disorder known as hemi-spatial neglect. This condition causes the patient to lose vision and awareness of anything happening on the left-hand side. This leads to numerous problems when carrying out daily tasks such as driving, eating and recognising people.

The treatment is a painless procedure known as ‘vestibular stimulation’ that involves the electrical or thermal stimulation of the balance organs within the inner ear. Its effectiveness in treating hemi-spatial neglect was demonstrated during trials in partnership with the local NHS Trust (supported by the Medical Research Council). Other benefits for brain-damaged patients include better face recognition, the restoration of speech and improvements in conditions such as persistent vegetative state.

New biomedical materials
School of Physical Sciences: Professor Ian Bruce

A research group at Kent, led by Ian Bruce, has pioneered the ability to control, manipulate and commercially process magnetite nanoparticles. The work began within a research project across six international universities, three Government agencies and three companies.

As a direct result of Kent’s research, two spinout companies EryDel and Diatheva have been established using a €6 million venture capital grant. Diatheva has used the novel technology to produce a forensic diagnostic kit. EryDel (in collaboration with Philips Healthcare) is using the technology to improve drug delivery for genetic diseases. The company is also investigating treatments for conditions such as pulmonary disease, cystic fibrosis, ulcerative colitis and Crohn’s disease.
Biopharmaceutical proteins

School of Biosciences: Professor Robert Freedman, Professor Mick Tuite

The use of pharmaceutical drugs produced in living cells has been steadily rising, with many of the most common biopharmaceuticals being proteins. Research to improve the production and secretion of these protein drugs by cells has become a crucial part of drug discovery and development.

Images of the retina

School of Physical Sciences: Professor Adrian Podoleanu, Professor David Jackson, Dr George Dobre

A ground-breaking method for imaging the human retina was pioneered by the Applied Optics Group at Kent. They were the first researchers to devise a way of using long-wavelength light to penetrate the opaque areas of the eye and provide a series of en face images of the tissues beneath the surface.

Known as en face OCT (optical coherence tomography), the original method sparked off a cycle of innovation in the field. The technology that emerged as a result is now routinely used in eye clinics worldwide, and is considered essential for the rapid and accurate diagnosis of eye diseases.
THE LONDON 2012 OLYMPICS

Kent contributed and responded in various ways to the London 2012 Olympics. Research ranged from assisting the training of British cyclists to the development of an anti-doping test. In the run-up to the Games, research at Kent also contributed to the national debate on the Olympic legacy.

Models for competitive cycling
School of Sport and Exercise Sciences: Professor Louis Passfield

A mixture of sports science and advanced mathematics was used to assist the GB Olympic Cycling and British Triathlon Teams and the British Paralympic Team in the London 2012 Olympics. The method, developed by Louis Passfield, was under embargo until after the Olympics to give Team GB a competitive advantage. It relied on analysing video footage from 360 world-class sprint races, calculating which tactics had the highest probability of success.

In addition, the research used mathematical modelling to study the training process, analysing power output from the bicycles of elite cyclists. In an earlier research project, Passfield collaborated with Brighton academics to develop the world’s first accurate virtual model of cycle and rider, used to emulate racing conditions.

Detecting growth hormone misuse
School of Mathematics, Statistics and Actuarial Science: Dr Eryl Bassett

Growth hormone administration can enhance athletic performance, but it can also have serious medical side effects and has been banned in sport for many years. However, its misuse is difficult to detect since the substance occurs naturally in the body in varying degrees and is quickly eliminated.

Statistical work at Kent, led by Eryl Bassett, helped to develop a reliable test for growth hormone misuse. The team developing the ‘biomarker’ test included medical scientists from St Thomas’ Hospital, London and the University of Southampton, and assay specialists from King’s College London. With support from authorities across the world, including the World Anti-Doping Agency (WADA), the test was used for the first time in the run-up to the 2012 London Olympic Games.

The Olympic legacy
School of Sport and Exercise Sciences: Dr Sakis Pappous

Research by Sakis Pappous has challenged conventional wisdom that sporting mega-events automatically lead to health benefits for the host population. One of the key pledges of London’s Olympic bid was to create a legacy of increased sports participation across the UK. Yet, at the time, there was little evidence to support this claim.

Pappous’ study looked at long-term gains in sports participation in Greece following the Athens 2004 Olympic Games. The results of his analysis indicated that, rather than producing any sustained increase, the Olympic Games in Athens only led to a temporary rise in sports participation and physical activity.

These findings were debated in the national media, including the BBC and the Guardian. The research also informed debate within Parliament. Internationally, Pappous’ evidence has influenced policymakers in Africa, South America and Europe.
Insolvency and consumer credit

Kent Law School: Professor Iain Ramsay

Iain Ramsay’s research into personal insolvency and regulation of consumer credit is being employed to create new policies around the world. In particular, in 2013, Ramsay co-authored a World Bank report on personal insolvency that has been influential in reform discussions in countries including Brazil, Colombia, South Africa and India.

His insights provide a platform from which to rethink regulatory frameworks that are sensitive to the specific needs of demographic groups, and to the kinds of vested interests that might serve to distort or undermine regulatory goals.

A number of UK organisations and committees (including the Select Committee on Business, Innovation and Skills, and Office of Fair Trading) have drawn on Ramsay’s research. He has also advised NGOs and contributed to a working group for the United Nations Guidelines on Consumer Protection.
Tax policy for recovery and growth

School of Economics: Professor Chris Heady

An analysis of tax policy by Chris Heady has been used to inform fiscal policy, both in the UK and overseas. The research included a statistical analysis of the effects of tax structure on investment, productivity and economic growth in a range of countries over a period of more than 30 years. The research combined these results with an analysis of how tax policy could affect short-term recovery and inequality.

The main findings were that a shift of taxation away from income taxes (personal and corporate) towards consumption and property taxes could increase growth. In particular, a reduction in the taxation of low-skilled workers would contribute to both the short-term goal of aiding recovery and the long-term goal of securing growth.

The research had a direct impact on public policy, informing HM Treasury’s decision in 2011 to increase the main rate of value added tax and accelerate the reduction in the rate of corporation tax. It has been cited by the Organisation for Economic Co-operation and Development (OECD) as a basis for policy reform to increase employment, and by the International Monetary Fund (IMF) as the basis for its analysis of tax composition and growth.

Paying for social care

Personal Social Services Research Unit: Professor Julien Forder

The demand for adult social care in England is predicted to rise as a result of the ageing population and trends in chronic diseases. Awareness of the challenge ahead has led to criticism of the current system of care funding. To address the pressing issue of cost and the need to reform the care system, Kent’s Julien Forder and José-Luis Fernández (London School of Economics) developed a full simulation model of the social care economy. This allowed them to identify limitations within the existing funding system and to quantify the costs and benefits of options for reform.

Used by the UK Government and the Dilnot Commission in the formulation of new funding policies, the research has also been used by groups such as Age UK to highlight the problems facing the funding of social care.

Supporting small farms in the EU

School of Economics: Professor Sophia Davidova, Dr Alastair Bailey

The Common Agricultural Policy (CAP) aims to ensure a fair standard of living for the farming community and accounts for about 40% of the EU budget. However, CAP payments have mainly tended to benefit large farms, despite the fact that small and semi-subsistence farms are on the increase and have low incomes.

Research by Sophia Davidova and Alastair Bailey examined the welfare of small farmers in Europe, helping to get this issue on to the EU policy agenda. Eventually, a simplified flat-rate payment scheme to support small farmers was incorporated into the reformed CAP (for the period until 2020). Passed by the Council of the EU and the European Parliament in 2013, it could potentially benefit millions of small farmers.
Comparing state and independent education

School of Economics: Professor Francis Green, Dr Yu Zhu

Research at Kent has made a detailed comparison between the state and independent education sectors. Francis Green and Yu Zhu, along with researchers at University College London, found that when compared to state schools, independent schools now have twice as many teachers per pupil.

Another important finding was related to the teaching of STEM subjects (science, technology, engineering and mathematics). Independent schools have dealt with the scarcity of staff in STEM subjects by offering better pay and working conditions, and this contributes to better student performance in these areas.

The findings made a valuable contribution to public debate on education, receiving national media coverage in *The Economist*, *Financial Times*, *Guardian* and BBC News Online.

Helping Kent’s smaller businesses grow sustainably

Kent Business School: Dr Mark Gilman, Dr Simon Raby

The Promoting Sustainable Performance project provided a deeper understanding of why some small to medium-sized enterprises (SMEs) achieve growth while others fail to achieve their aspirations. The research engaged with over 300 SMEs in Kent and identified ten key growth enablers.

These formed the basis of The BIG Journey – an executive education programme for smaller businesses. The participating SMEs reported an average increase in sales turnover of 18.8% and an increase in employment levels of 13.6%, adding £2.8 million to the local economy in Kent. Both the research for Promoting Sustainable Performance and The BIG Journey are ongoing, with the project now in its third cycle.

Policymakers used the research to inform strategy on issues such as inward investment, high-growth firms and regional business support. Several UK Government bodies engaged with the outcomes including the Department for Business, Innovation & Skills, the UK Commission for Employment and Skills, and the European Social Fund.
Providing consumer insight

Kent Business School: Professor Andrew Fearne

Andrew Fearne’s research project into consumer insight has influenced the marketing practices of over 600 farming and small food businesses. The research used a variety of methods based on supermarket loyalty card data (segmented by life stage, lifestyle, region and geo-demographics). This data provided a rich and robust picture of consumer responses to changes in the marketing mix.

Participating farmers and small food producers used consumer insight reports in a variety of ways: for competitor analysis; to retain or increase their supermarket business; for new product development; and for promotional planning. Benefits were wide-ranging: for instance, one company saw a rise in sales of 130% by introducing new product varieties that appealed to its target market.

Tesco also reported benefits from having better informed suppliers; the project helped Tesco grow its sales of local food and drink (largely from farming and small food businesses) from £0.5 billion (2005) to over £1 billion (2012).

Performance management in China

Kent Business School: Professor John Mingers, Professor Steve Wenbin Liu

Research by John Mingers and Steve Wenbin Liu has led to the creation of a new performance management system, developed in China. The ‘3E’ system puts the emphasis on effectiveness, efficacy and efficiency. It is particularly suitable for organisations that are facing complex management challenges, or conditions of rapid growth and change.

The ‘3E’ system has been successfully used in Chinese organisations and companies, such as the Chinese Academy of Sciences and Tonsan Adhesives. The tasks it has been used for include developing performance indicators, improving management communication and designing appraisal systems.
MILLION-POUND DONORS

Research at Kent has provided valuable new data on charitable giving, as well as some revealing insights into how rich donors make their decisions.

School of Social Policy, Sociology and Social Research: Dr Beth Breeze

Beth Breeze’s research into rich donors in the UK revealed that most charitable-giving decisions are taste-based, rather than needs-based. People tend to support causes that they have a personal interest in, or connection to, rather than backing the most objectively ‘worthy’ causes. Other significant factors include the belief that contributions will make a tangible difference, and confidence in the charity’s competence to fulfil its mission.

Media coverage of philanthropy tends to focus on those seeking to set global agendas by funding international development, global health and environmental issues. However, Breeze (above) also found that many donors are motivated by more traditional factors, such as religious beliefs, social duty and a desire to help in their local area.

The research provided other unique insights into changing forms of charitable giving associated with wealthy donors, and generated new data describing the scale of this phenomenon. It has been influential for policymakers in charities and the UK Government. The data was also used by the ‘Give it back George’ campaign, which persuaded the Government to drop its proposal in the 2012 budget to cap tax relief on charitable donations.

In 2013, the website www.civilsociety.co.uk named Breeze as one of the ‘50 Most Influential’ people in fundraising.
Open source security software
School of Computing: Professor David Chadwick

David Chadwick and other researchers at Kent have developed a suite of open source security software. Freely available, it gives all software developers the chance to include authorisation functionality within their systems. It has therefore helped to create better security for a large number of end users.

Known as PERMIS (PrivilEge and Role Management Infrastructure Standards), the state-of-the-art software is compatible with environments such as grids, clouds and more specialised domains. It has been used in a variety of sectors including military, commercial and governmental. For example, the Swiss Ministry of Defence adapted PERMIS for its own use in an air force application. Thousands of users continue to download the software every year.

Improved programming practice
School of Computing: Professor Simon Thompson

Refactoring is the process of improving the design of a system without changing what it does. It can go hand in hand with program development, or can be performed as a part of program maintenance.

The functional programming team at Kent, led by Simon Thompson, built the first comprehensive tools for refactoring functional programs. Programmers in both open source and commercial projects use the tools to improve their programming practices and to restructure existing systems. This improves the quality of the software, reducing problems for end users and costs for companies. As a result, the tools are increasingly used by mainstream developers.

Since the projects are open source, others can support them by contributing their own code; contributions have come from the UK, Europe and internationally.
High-quality crystals for national security

School of Physical Sciences: Dr Maria Alfredsson, Dr Aran Blacklocks, Professor Alan Chadwick, Dr Gavin Mountjoy

X-ray scanners are a staple of the security industry; their use at ports and airports is a key component of national security. However, the identification of objects is not always straightforward, partly because of blurring due to an electronic process called ‘afterglow’.

The company Hilger Crystals, which grows crystals for use in X-ray scanners, collaborated with researchers at Kent to determine the origins of afterglow. This led to the development of high-quality crystals with reduced afterglow and sharper images. These state-of-the-art crystals are now in production for use in X-ray scanners, and there is also potential for their use within medical diagnostics.

Transforming teenagers’ learning experience

School of Computing: Professor Michael Kölling, Neil Brown, Davin McCall, Ian Utting

Led by Michael Kölling, the Greenfoot project has transformed the way that teenagers learn how to program – beginners can learn new programming skills by developing games and simulations. Greenfoot allows learners to experiment while developing their skills and, thanks to immediate feedback, it motivates them and helps them to engage in the process. Greenfoot’s user community and discussion group also has a major influence on the learning experience.

Greenfoot has more than 600,000 new users each year – in schools, in after-school clubs and at home. It is one of the very few systems, internationally, to achieve this level of impact on programming education.

Statistical methods of calibration

School of Mathematics, Statistics and Actuarial Science: Professor Jim Griffin, Professor Stephen Walker, Dr Xue Wang, Dr Maria Kalli

Statisticians at Kent have come up with a new way to calibrate industrial measuring instruments. These instruments – typically flow meters and density meters – need to be extremely precise and this is reliant on accurate calibration, often an expensive and time-consuming process.

The new method of calibration developed at Kent makes it possible to reduce the number of test runs and increase capacity by up to 50%. It achieves these gains using Bayesian methodology to incorporate data from previous calibrations. A further benefit is that any anomalies in the data are less influential because the Bayesian approach ‘borrows strength’ from the historical data. This reduces the likelihood that a meter will need to be recalibrated.
The future for computer systems
School of Computing: Professor Peter Welch

Society’s expectation of ever more complex computer applications requires fluent mastery of ‘concurrency’ where many computations are happening at the same time. For instance, Big Bee Consultants used Kent’s research on concurrency within the control centre for the London Congestion Charge.

Researchers at Kent were among the first to argue that concurrency is a necessary element in the way computer systems are designed, verified, implemented and maintained. Research by many academics, including Peter Welch, has been used within chip design, large-scale real-time systems, formal interfaces and testing, and the space industry. Companies using the research include: Big Bee Consultants, NXP Semiconductors, Philips Healthcare, 4Links and Microsoft Research Cambridge.

Public access to mathematical functions
School of Mathematics, Statistics and Actuarial Science: Professor Peter Clarkson

The Digital Library of Mathematical Functions (DLMF) provides detailed information about mathematical functions for engineers, scientists and the general public. Published online (freely available) and as a book by Cambridge University Press, it plays a vital role in supporting the development of new technologies.

The project was funded by the US National Institute of Science & Technology (NIST) and includes a chapter by Peter Clarkson that is based on research at Kent. Clarkson's chapter is on a topic of increasing importance, Painlevé Transcendents, relevant to numerous mathematical and physical phenomena.

Radio-frequency engineering
School of Engineering and Digital Arts: Dr John Batchelor, Professor Ted Parker, Dr Benito Sanz-Izquierdo

Wi-Fi connectivity and mobile phone coverage can be problematic in buildings with signal blockage and interference. Research at Kent has tackled this problem with the design of antennae and frequency selective surfaces (FSS) that can be intimately integrated into buildings.

Kent has also developed antennae for vehicles. Collaboration with Harada Europe led to integrated antennae that take advantage of roof panels, boot lids and bumper mouldings. More recently, work on skin-mounted antennae led to printed transfer tattoos of radio-frequency identification tags. Such tags can be used for security and ticketing, or for hospital patients, to ensure their medical regimes are followed.
The identification of individuals through their physiological or behavioural characteristics is part of the rapidly-growing field of biometrics – an area where Kent research is breaking new ground.

**Facial recognition**

School of Physical Sciences: Dr Christopher Solomon, Dr Stuart Gibson

Research at Kent has revolutionised the way that facial composites are created. The facial recognition suite (EFIT-V), created by Kent’s spinout company VisionMetric, is now used by more than 90% of police forces in Britain and has been sold to 16 countries around the world, including the US, Canada, Australia, Chile, South Africa and Sweden.

In the commercial systems used before EFIT-V, a witness had to select the best match for facial features from a database of stored images. However, facial recognition does not happen in this way but via a more holistic impression – in other words, people find it easier to recognise a face than to recall and describe its individual features.

To mimic the process of face recognition, EFIT-V uses methods of computerised facial synthesis and provides the eyewitness with flexible ways to alter its appearance to achieve a facial likeness. The improved images, circulated within the police force and to the general public, have led to identification rates jumping from 5% to 55%.

**Iris recognition**

School of Engineering and Digital Arts: Professor Michael Fairhurst, Dr Farzin Deravi, Dr Richard Guest, Dr Gareth Howells, Dr Konstantinos Sirlantzis

Kent’s research on biometrics – the identification of individuals through their physiological or behavioural characteristics – has led to significant developments within industry. At present, analysing the unique patterning of the iris within the human eye is one of the most popular methods in use.

Research at Kent, in collaboration with British company Smart Sensors, has developed new ways to improve iris recognition systems, overcoming previous constraints such as the need to direct the gaze straight at the camera. The approach developed at Kent is flexible enough to deal with multiple gaze angles in varying light conditions.

The team has also worked on areas such as handwriting and signature recognition, as well as facial recognition. Michael Fairhurst has been influential in the wider debate on the use of biometrics, advising the UK Government on the technology for biometrics, as well as related ethical and privacy issues.
Protecting the Mary Rose

School of Physical Sciences: Professor Alan Chadwick, Professor Bob Newport

Timber ships that have been raised from the seabed are prone to erosion when they come into contact with the air. However, when the Mary Rose was raised from the seabed after half a millennium, she was protected by pioneering techniques developed at Kent. Led by Alan Chadwick, alongside Bob Newport, the research involved the discovery of a compound to treat the ship’s wood and to prevent the deposits of sulphur salts on its surface.

Now exhibited in Portsmouth Historic Dockyard, the Mary Rose is one of the most important additions to UK culture in recent times – as a warship, she served in Henry VIII’s navy for 34 years and sank while engaging the French navy in 1545.
Propaganda, power and persuasion
School of History: Professor David Welch

As an international authority on propaganda and persuasion, David Welch took on the role of historical consultant and on-air commentator for a TV project entitled *Love, H ate and Propaganda*. Commissioned by the Canadian Broadcasting Corporation, the project produced three series, *The Second World War, The Cold War*, and *The War on Terror*, broadcast in five countries.

Welch’s expertise shaped the content by suggesting that propaganda is a means of persuasion practised by governments of all ideological leanings – including democracies. The series aimed to give the audience an understanding of propaganda as an all-persuasive element in public discourse and not simply a method of mass brainwashing.

Welch has also acted as historical consultant for the exhibition at the United States Holocaust Memorial Museum, ‘State of Deception: The Power of Nazi Propaganda’, and as co-curator and historical consultant for the British Library exhibition, ‘Propaganda: Power and Persuasion’ for which he wrote the accompanying book.

The history of Christmas
School of History: Professor Mark Connelly

Mark Connelly’s research provides an extensive survey of the development of ‘Christmas’ and its spread from England out to the British Empire. His research ranges from Victorian scholars, who fervently – and mistakenly – believed in the tradition’s ancient roots, to how department stores in the late 1860s transformed Christmas by ritualising its shopping and turning the art of window-dressing into a platform for a range of historical and patriotic messages.

Connelly’s academic contributions to this area reached a public audience through his heritage and media work. This included acting as a consultant for the Geffrye Museum’s ‘Christmas Past’ exhibition and contributing a podcast for the National Gallery, London. He was also a consultant on TV programmes, including the BBC documentary, *The Toys That Made Christmas*. 
The clergy of the Church of England
School of History: Professor Kenneth Fincham

The Clergy of the Church of England Database 1540-1835 (CCEd) is an online resource that is free to all users. It provides a database and website containing key information on clergy, schoolteachers and ecclesiastical patrons, and brings together for the first time a comprehensive range of sources.

Produced by Kenneth Fincham (Kent) and fellow researchers Stephen Taylor (Durham) and Arthur Burns (Kings College London), the CCEd was designed to serve users within and outside academia. Attracting around 100,000 visitors a year, the CCEd is generating new academic research and proving an invaluable resource for local historians, genealogists, independent researchers and archivists. An article in the Guardian stated that CCEd’s ‘true significance may be its role in opening up the raw material of scholarship to the widest possible audience’.

Roman culture in Canterbury
School of European Culture and Languages: Ray Laurence

When plans were announced to close Canterbury Roman Museum, Ray Laurence drew on research at Kent to offer an alternative. He demonstrated the potential for research related to the museum’s collection, as well as novel ways to engage with its visitors.

Laurence’s academic work includes the study of Roman children in public spaces. This informed his suggestion that the museum lacked positive portrayals of women and children; when they did appear in the displays, they were disconnected from a concept of the family – an important audience for the museum sector.

Canterbury City Council reversed its decision to close the museum; instead making its development a priority. Laurence continues to collaborate with the museum, by developing related research and delivering talks. He has also worked with the company Cognitive to develop animated content, based on Kent’s 3D laser-scan of a figurine from the museum’s collection.

Other collaborations with Cognitive have included the production of animations with educational content for the free-to-view network, TED-Ed.
Cultural values within heritage management

School of European Culture and Languages: Dr Evangelos Kyriakidis

Evangelos Kyriakidis’ research argues that heritage management should direct its attention to the development and conservation of ‘heritage values’ – what a site stands for. His fieldwork on public engagement enabled people living in the village of Gonies, Crete to relate more strongly to the heritage values of the nearby Minoan Three Peak Sanctuaries, in order to plan for the site’s protection and promotion. The village has a strong local identity and a long-standing reputation for stone masonry, both of which proved important to its transformed relationship with the archaeological site.

The case for taking a more inclusive approach to heritage management is now influencing the Greek Ministry of Culture and Sports in its proposals for sites in Athens (such as Kerameikos and Brauron), and the management of sites elsewhere, such as Pompeii. Demand for training led to the launch of Kent’s MA in Heritage Management in Athens and projects for the Initiative for Heritage Conservancy.

Peruvian political history

School of European Culture and Languages: Dr Natalia Sobrevilla Perea

Natalia Sobrevilla Perea’s research into Peruvian political history included a detailed account of the country’s repeated attempts to establish constitutional government. She has situated current political processes within a broader historical context, demonstrating the centrality of elections and the importance of constitutions for political transformation.

This perspective has enabled her to provide valuable commentary on a range of issues in contemporary politics, such as the trial of former president Alberto Fujimori (convicted of human rights abuses), or the plight of the women who underwent forced sterilisation in the 1990s. Her writings have been highly influential; her blog on the Fujimori trial sparked a new debate on his legacy, and an article in the Guardian about forced sterilisation was used as part of the campaign to reopen the case.

Sobrevilla Perea has also led a project to catalogue and digitise newspapers held in provincial Peruvian archives, in order to inform political debate.

Re-evaluating historic buildings

Kent School of Architecture: Dr Timothy Brittain-Catlin

Changes in architectural practice during key periods in British history often meant that the architects of the day were forced to adopt new styles and practices, or face a serious loss of reputation.

Timothy Brittain-Catlin’s research has led to a re-evaluation of many architects who fell out of favour in their own times. Through gaining access to neglected archives, he was able to find new historical evidence and suggest alternative interpretations of ‘unsuccessful’ architects such as Horace Field and Leonard Manasseh.

As a result of the research, creations by Manasseh and other architects have been granted protection as listed buildings. Manasseh is also to be included in the next edition of the Oxford Dictionary of Architecture and Landscape Architecture.
At a time when environmental design is constantly being discussed, the award-winning Le Petit Bayle – set in a remote region of France – is receiving accolades from many specialists in the field. Kent's Jef Smith and his London-based practice, Meld Architecture, worked with Victoria Thornton to design the house using simple, low-tech sustainability strategies.

The house is made using local materials, relies on solar energy to heat it in the winter and shading devices to cool it in the summer, and makes careful use of rain. Yet the sustainability was not merely about pragmatic choices but became an integral part of the design – generating the selection of the form and materials.

Le Petit Bayle has featured prominently in high-profile publications such as The Architectural Review, the Architects’ Journal, and the RIBA Journal, as well as popular publications, such as Grand Designs magazine. It regularly attracts visits from professionals and public alike.
Designing nature reserve networks

School of Anthropology and Conservation: Dr Bob Smith

Identifying priority areas for conservation is an important global issue. However, much of the related research fails to account for the factors that lead to action on the ground.

Research by Bob Smith sought to address these limitations in conservation planning. Working with communities in South Africa, Swaziland and Mozambique, a project, led by Smith, incorporated new data into a transnational conservation plan. It assessed possible reductions in farming opportunities, as well as the potential revenues from wildlife ranching. Combined with data on species and habitats, the study identified priority conservation areas that met biodiversity targets while protecting the livelihoods of local people.

Smith’s work has guided the development of 25,000 hectares of nature reserves, including a corridor that connects a previously fragmented elephant population. It has also been used by the Critical Ecosystem Partnership Fund to identify priorities for its US$6.5 million funding programme.

Statistical tools for ecologists

School of Mathematics, Statistics and Actuarial Science: Dr Takis Besbeas, Dr Stephen Freeman, Dr Gututzeta Guillera-Arroita, Professor Byron Morgan, Professor Martin Ridout

Reliable data is essential for the conservation of wild animal populations and the preservation of biodiversity. Statistical ecology research at Kent has allowed ecologists to collect higher-quality data in more efficient ways and has given them access to new methods for data analysis.

The use of these tools is now standard practice in ecology projects around the world. For example, the methods were used to gain an improved understanding of the decline of British farmland birds, such as the lapwing, the house sparrow and the song thrush, which has been used to underpin conservation plans. They also formed a key element of the analysis of data from tiger surveys, supporting the Indonesian Government’s National Tiger Recovery Plan.
Reducing carbon emissions
School of Engineering and Digital Arts: Professor Yong Yan, Dr Gang Lu, Dr Peter Lee and Clive Birch

New technology developed at Kent could play a major role in the global challenge of tackling climate change. It was used to help Drax, the largest power station in the UK, move from firing coal to a combination of biomass and coal, as it sought to halve its carbon footprint within five years.

Based on new instrumentation, the technology allows the engineers to diagnose the combustion process and optimise the operation of coal, biomass and heavy-oil-fired power plants. It has been applied in countries including the UK, France, China and Saudi Arabia, and is likely to have the greatest impact in countries such as China, where up to 70% of energy is generated from coal-fired power plants.

Surveys of amphibians and reptiles
School of Anthropology and Conservation: Professor Richard Griffiths

Innovative new survey protocols for amphibians and reptiles are already changing conservation and planning practice in the UK. Prior to Richard Griffiths’ research, survey protocols had changed little in 20 years. This issue was particularly pressing in the commercial sector, with developers spending up to £125 million a year to mitigate impacts on some species.

Using statistical models, Griffiths’ team determined the combination of survey visits and methods needed to obtain reliable data on population status. This resolved a long-standing debate within the fields of conservation and ecology and has made surveys significantly more cost-effective and reliable.

The protocols are being adopted into policy guidance in England, Wales and Scotland and will help to improve the management and conservation of important amphibian and reptile species.
Saving species

School of Anthropology and Conservation:
Dr Jim Groombridge

Islands host a high proportion of global biodiversity and are important to evolutionary science. These ‘living laboratories’ also host many of the world’s rarest species, making them a global conservation priority.

Work by Jim Groombridge at Kent has identified that rare populations of birds and frogs on Mauritius and in the Seychelles have surprising levels of evolutionary distinctiveness. This led to them – and other island species – becoming a high priority for conservation efforts.

With his focus on evolutionary and molecular research, Groombridge uses innovative techniques within his work. For instance, one project involved sequencing the DNA of extinct species, relying on 200-year-old parrots that had been preserved as museum specimens. This helped to provide more information to protect an endangered species of parakeet on Mauritius.

Developing environmental law

Kent Law School: Professor William Howarth

Despite the clear need for sustainable management of our seas, rivers and wetlands, creating a legal framework that can deliver this in practice is an ongoing challenge. Much of William Howarth’s work challenges the traditional legal approach, which tends to focus on high-profile industrial pollution and criminalising those who contravene the law. Instead, he argues for ‘modernisation’ with an increased emphasis on the cumulative impact of individual lifestyles, as well as the idea of ‘purposiveness’ – using legislation to achieve specified environmental standards.

Howarth’s research has been influential within the UK’s Department for Environment, Food and Rural Affairs (DEFRA). Most notably, it has contributed towards moves to create a more proportionate and effective enforcement system in England and Wales.
Backpackers or cruise ships?

Kent Business School: Dr Mark Hampton, Dr Julia Jeyacheya, Professor Andrew Fearne

For the world’s 40 small island developing states (SIDS) and poor coastal communities, tourism can offer much-needed revenue and employment. However, when it comes to the value of large-scale tourism, Mark Hampton’s research has challenged conventional wisdom. His findings demonstrate that smaller-scale niche tourism can represent a more sustainable basis for economic growth. In a report for the World Bank, Hampton showed how international hotel chains present a challenge to inclusive growth and highlighted the benefits of locally owned niche tourism ventures. Another study for the Commonwealth Secretariat, with Kent colleagues Julia Jeyacheya and Andrew Fearne, offered a critique of the benefits of cruise tourism to small island economies, as well as making practical recommendations on how local food producers could supply tourist hotels.

These and other research findings have been used by the two agencies to support evidence-based policy development. Hampton’s work has also influenced governments, as well as numerous other NGOs and industry associations.

Protecting agricultural heritage systems

School of Anthropology and Conservation: Professor Stuart Harrop

Traditional agricultural systems are often able to integrate sustainably with their environments, supporting a wealth of biodiversity. These characteristics are usually due to the long-evolved adaptation of rural communities to the environment.

Those recognised as ‘Globally Important Agricultural Heritage Systems’ (GIAHS) are supported by policies created by the Food and Agricultural Organisation (FAO) of the United Nations. The measures are designed to protect these traditional landscapes along with the linked biodiversity, knowledge systems, livelihoods and cultures.

Stuart Harrop’s research provided the FAO with valuable advice on how international law and policy could protect GIAHS in many areas, including the intellectual property rights related to land management practices. His findings in this area continue to underpin the approach to the FAO’s most recent work, which uses existing legal and policy arrangements to protect these important landscapes and communities.
RESEARCH EXCELLENCE FRAMEWORK

The research projects within this publication were part of Kent’s submission to the Research Excellence Framework (REF) in 2013. The REF is a system to assess the quality of research in the UK’s higher education institutions; results will be released in December 2014.

For news on the latest research at Kent, see www.kent.ac.uk/news