

The greatest threat to an organisation such as the University of Bristol is complacency.

Looking back over the institution's first century (or, as in this report, over the past year), it would be perilously easy to become smug. After all, we have terrific students, brilliant staff, a dazzling track record in learning, discovery and enterprise and an enviable reputation both here and abroad.

We feel that the University has avoided the complacency trap by dwelling less on 'Didn't we do well?' than on 'How can we do better?'. Hence, for example, the £350 million-plus we aim to invest in buildings and facilities over the next few years; the focus on the quality of the student learning and residential experience; and the emphasis on innovation in both academic and administrative pursuits.

For its part, Council, the University's governing body, has been paying more attention to strategy and less to detail. It has also sought a deeper understanding of the environment – political, social and otherwise – in which the University is likely to be operating in the years ahead. As the institution approaches its centenary in 2009, the fundamental question for Council is 'What makes a very good university truly great?'.

We hope this report conveys something of the range of the University's achievements in 2007/08. We think the progress made is impressive and we thank and congratulate all those who have been part of it. At the same time, we remain eager to explore what's new, what's next and how far the University can go in pursuit of its mission and vision and in line with its core values.



Professor Eric Thomas



Jim Foulds

A handwritten signature in blue ink, appearing to read 'Eric Thomas'.

Vice-Chancellor

A handwritten signature in blue ink, appearing to read 'J.S. Foulds'.

Chairman, University Council

research and enterprise

Researchers at the University of Bristol continue to cross the borders between disciplines and apply new techniques to old (and new) problems, and the results of their work are finding applications all over the world and in every sector.

Right: Earth Sciences MSc student Steve Brusatte on the site of a major fossil discovery in the Sahara Desert (see p4)



Student names new meat-eating dinosaurs

The remains of two previously unknown 110-million-year-old carnivorous dinosaurs have been named by a postgraduate in the Department of Earth Sciences and his former professor from fossils dug up in the Sahara Desert.

MSc student Steve Brusatte collaborated with his former research adviser, renowned palaeontologist and dinosaur hunter Dr Paul Sereno, on describing the finds, which they named *Kryptops palaios* ('old hidden face', because of the horny covering on its short snout) and *Eocarcharia dinops* ('fierce-eyed dawn shark', referring to its blade-shaped teeth and bony eyebrow). Their paper appeared in the journal *Acta Palaeontologica Polonica*.

£7m supercomputer open

A new supercomputer facility known as BlueCrystal that will revolutionise research in areas such as climate change, drug design and aerospace engineering was opened in May at the University by the Vice-Chancellor, Professor Eric Thomas.

BlueCrystal is one of the fastest and largest computers of its kind in the UK, able to carry out more than 37 trillion calculations a second. The state-of-the-art system, provided as a result of collaboration between various companies including ClusterVision, IBM and ClearSpeed, enables researchers from a wide range of disciplines to undertake research requiring either very large amounts of data to be processed or lengthy computations to be carried out.

Major users include climatologists in the School of Geographical Sciences who are developing models to predict

climate change; researchers in the Department of Biochemistry using computer simulations to search more efficiently for anti-cancer drugs that will prevent secondary tumours developing from breast cancer; and engineers in the Department of Aerospace Engineering who are using BlueCrystal to investigate the aerodynamics of helicopter blades at a level of resolution not previously possible.

Skin care: new research into scar-free healing

Research by Professor Paul Martin and colleagues in the Department of Physiology and Pharmacology shows that by suppressing one of the genes that normally switches on in wound cells, wounds can heal faster and with less scarring. This has major implications not just for wound victims but also for people who suffer organ tissue damage through illness or abdominal surgery.

Tissue damage triggers white blood cells to guide the production of layers of collagen that help the wound to heal, but these layers stand out from the surrounding skin and result in scarring. Research by Professor Martin and his colleagues shows that a gene called osteopontin (OPN) triggers scarring, and that applying a gel which suppresses OPN around the wound can accelerate healing and reduce scarring. The technique involved is currently being licensed and patented by a Biotech company, CoDa, which specialises in wound-healing therapies.

Lack of dental care may have life-threatening implications

Research by Dr Steve Thomas and colleagues from the Division of Maxillofacial Surgery and Department of Oral and Dental Science shows that admissions for the surgical treatment of dental abscesses have doubled in the last ten years, although these serious infections are preventable with regular dental care. The findings were derived from a study of routine NHS data on hospital admissions and published in the *British Medical Journal* in May.

Dr Thomas and his team were prompted by three complex cases of dental abscess that illustrated their serious and potentially life-threatening consequences; in two cases the patients had to be admitted to a

hospital critical-care unit. None of the three was registered with a dentist.

The reasons for this increase are unclear, but the paper suggests a link to changes in dentists' remuneration, which led many to reduce their NHS workload so that fewer adults in England are registered with an NHS dentist. Another explanation cites a recent survey by the Commission for Patient and Public Involvement in Health which found that 22 per cent of respondents had declined treatment because of cost.

The authors recommend that access to dental care be urgently reviewed and formal referral systems established so that patients presenting to them with acute dental sepsis will get proper treatment.



An artist's impression of *Eocarcharia dinops*



Elizabeth Vernon, Countess of Southampton,
by an unknown artist, circa 1620;



and an X-ray of the same portrait

Shakespeare's 'man of the sonnets' revealed

MA students in the Department of History of Art uncovered a 'ghost figure' underneath a Tudor portrait. The figure may be William Shakespeare's only known patron, Henry Wriothesley, Third Earl of Southampton, which had been painted over with a portrait of Elizabeth Vernon, Southampton's wife.

The discovery was made when the portrait was X-rayed as part of the preparation for an exhibition curated by the students, 'On the Nature of Women: Tudor and Jacobean Portraiture 1535-1620', held at Montacute House, Somerset,

a National Trust property and a regional partner of the National Portrait Gallery. The figure resembles other portraits of Southampton made around the same time, some of which have been attributed to the Dutch artist Paul van Somer (circa 1576-1621).

Does the internet really influence suicidal behaviour?

A study led by members of the Department of Social Medicine and published in the *British Medical Journal* suggests that people searching the internet for information about suicide methods are more likely to come across sites that encourage suicide rather than ones offering help and support.

Dr Lucy Biddle, Professor David Gunnell and Professor Jenny Donovan from the Department of Social Medicine, with colleagues from the universities of Oxford and Manchester, set out to replicate a typical web search that someone might undertake if looking for information about methods of suicide. They used the four most popular search engines – Google, Yahoo, MSN and Ask – and 12 simple search terms. They analysed the first ten results from each search, giving a total of 480 hits. Altogether, 240 different sites were found, almost half of which provided information about methods of suicide. Nearly a fifth of hits (90) were for dedicated suicide

sites, and half of these were judged to be encouraging, promoting or facilitating suicide.

In the absence of UK regulation of such sites, the authors suggest that service providers might pursue website optimisation strategies to increase the likelihood that web searches by people seeking information about suicide methods will yield links to anti-suicide sites.

Major breakthrough for non-stick chewing gum

Easy-to-remove chewing gum is to become a reality, thanks to a major technological breakthrough. Revolymer, a spin-out company from the University of Bristol, announced at the BA Festival of Science in York in September 2007 that it had completed development of Clean Gum, a product that can be easily removed from shoes, clothes, pavements and hair. Preliminary results also indicate that the gum will degrade naturally in water.

Professor Terence Cosgrove from the School of Chemistry, Chief Scientific Officer of Revolymer, said: 'The basis of our technology is to add an amphiphilic polymer to a modified chewing gum formulation which alters the interfacial properties of the discarded gum cuds, making them less adhesive to most common surfaces.'

In May 2008, the company announced that it had secured £10 million of further funding with a range of new investors.

Streamlined design tool from Enterprise Competition winners

Designing new products in the aerospace, automobile and sports industries could become dramatically cheaper and faster, thanks to new technology from the winners of the University's 2008 New Enterprise Competition.

Eclat Solutions Ltd (led by a team in the Department of Aerospace

Engineering, including Professor Christian Allen and PhD students Asa Morris and Thomas Rendall) has developed new software that enables engineers to 'crawl' virtually inside their designs and see how they perform.

The software uses computational fluid dynamics to simulate flows of gases and liquids, heat and mass transfer, moving bodies and chemical reaction. The range of applications includes measuring the effect of air velocity on aircraft wings and the impact of airflow on the performance of Formula 1 racing cars, as well as examining the effect on a human airway of breathing different-sized particles and measuring the effect of flow over an elite swimmer gliding under water.



Professor Terence Cosgrove with a sample of Clean Gum



Dr Andy Radford with a pied babbler

Birds co-operate too

New research published in *Current Biology* by Dr Andy Radford (above) in the School of Biological Sciences reveals that the co-operative behaviour of soldiers on sentry duty is also a feature of the bird world. Contrary to the selfish behaviour suggested by the principles of natural selection, Dr Radford demonstrated how a look-out sentry for a group of foraging birds (pied babblers) informs the group of its presence by calling out a distinctive 'watchman's song'.

These calls, which he observed in a population of pied babblers in the Kalahari desert in southern Africa, allow the group to continue foraging without having to look up and check for the presence of a sentry, thereby increasing foraging time and improving the group's survival rate.

Bristol academic makes *Time* Top 10

Time magazine's Top 10 Scientific Discoveries of 2007 included, at number 8, research by an international team including Dr Alistair Pike in the Department of Archaeology and Anthropology, revealing the first fossil evidence that modern humans left Africa between 65,000 and 25,000 years ago. Dr Pike was invited to help the team devise new approaches to fossil dating in order to determine accurately the age of a skull unearthed in South Africa in 1952. Their discovery provides a chronologically credible link between humans in sub-Saharan Africa and Europe and shows that Europe was probably first populated by modern humans deriving from an African population.

The collaboration was led by Stony Brook University in the US with the universities of Bristol, Oxford, Cape Town and Montreal and the Max Planck Institute in Leipzig.

Study reveals social housing flaws

A study by academics in the School of Law has revealed serious problems with social housing nominations and the effects on re-housing vulnerable households.

The ESRC-funded research, led by Professor David Cowan, Dr Morag McDermont and Dr Karen Morgan in partnership with Shelter, the Local Government Association and the National Housing Federation, has identified issues arising when local authorities nominate people whose behaviour or lifestyle might pose problems for social landlords.

A decline in local authority-owned social housing has meant that social landlords assist in meeting housing needs more than ever before. But local authorities are accused of not giving the landlords enough information about households, and the landlords are accused of cherry-picking their tenants. The consequences range from re-housing delays to households being excluded.

The University attracted a total of £117 million in research grants during 2007/08. This included the following:

\$13 million from the Bill & Melinda Gates Foundation to an international multidisciplinary consortium, led by Professor Stephen Gundry, Director of the University's Water and Health Research Centre, to develop Aquatest, the world's first low-cost, easy-to-use diagnostic tool to give a clear, reliable indication of water quality. The World Health Organization estimates that water-borne disease causes 1.8 million deaths annually, of which 1.5 million are of children under five. Over one billion people lack access to safe water; most do not even know their water is unsafe.

£1.4 million from the Biotechnology and Biological Sciences Research Council to the universities of Bristol and Warwick to investigate a disease in sheep called foot-rot, a painful hoof infection which eventually leads to lameness and is estimated to cost the UK sheep industry £31 million per year.

Over £1 million from the Engineering and Physical Sciences Research Council (as part of its Challenging Engineering programme) to Dr Jeremy O'Brien in the Department of Electrical and Electronic Engineering and Department of Physics for research into photonic quantum information science, which could be used in future technologies like quantum computers.

£1,002,293 from the Engineering and Physical Sciences Research Council to Professor Varinder Aggarwal in the School of Chemistry for a project entitled 'General and convergent strategy for asymmetric synthesis'.

Renewal of an **£800,000** British Heart Foundation Programme Grant to Professor Julian Paton and Dr Sergey Kasparov in the Department of Physiology and Pharmacology for the continuation of their project, 'Vascular-neuronal signaling in the nucleus tractus solitarius: novel implications for blood pressure control'.

£1.2 million from the Health Technology Assessment programme of the National Institute for Health Research to a team of researchers, led by Dr Nicola Wiles in the Academic Unit of Psychiatry (and also involving the University of Exeter, the Peninsula Medical School, the University of Glasgow and Avon and Wiltshire Mental Health Partnership), to test effectiveness of cognitive behavioural therapy for patients with depression who do not respond to treatment with antidepressants.

£50,148 from the Leverhulme Trust to Dr Ad Putter in the Department of English to develop the international network 'Multilingualism in the Middle Ages'. The network is an international collaboration between a number of universities in the UK, Europe and the US (who are all members of the Worldwide Universities Network), in association with Brepols Publishing.

Over £500,000 from the Biotechnology and Biological Sciences Research Council to groups in the Laboratories for Integrative Neuroscience and Endocrinology and the MRC Centre for Synaptic Plasticity. The funding will support research (led by Professor Kei Cho) into how brain cells maintain their performance, and create memories, during periods of acute stress.

£650,000 from the Arts and Humanities Research Council for the Penguin Archive Project, led by Dr John Lyon in the Department of English with co-investigators George Donaldson (English), Dr Hugh Pemberton (Historical Studies) and Dr Ika Willis (Classics). The Penguin Archive, held in the University Library's Special Collections, comprises more than 2,300 boxes of letters, notes and other papers spanning the history of the publishing company from its establishment in 1935, by Bristol-born Allen Lane, to the present day.

grants