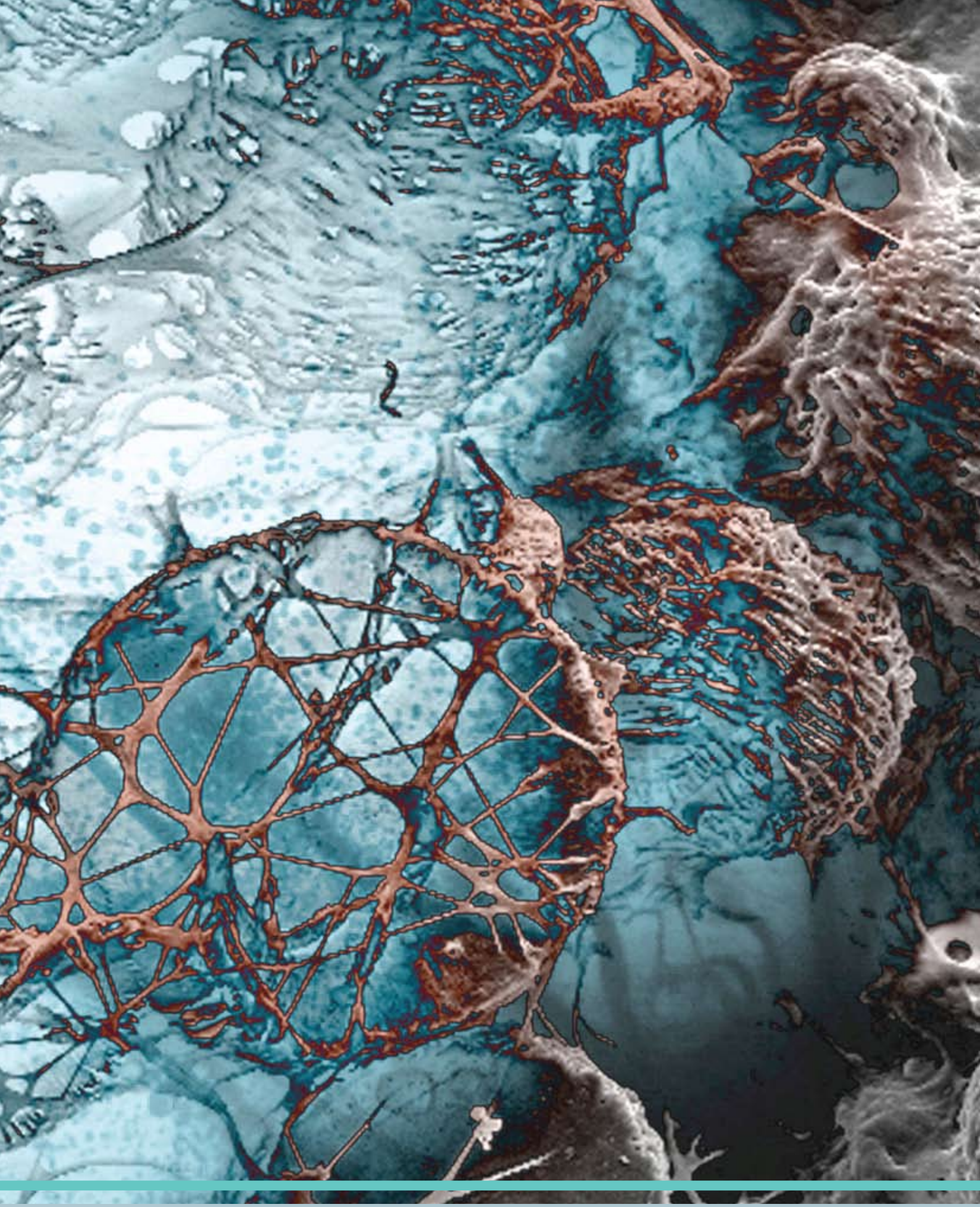


UNIVERSITY OF DUNDEE

University of Dundee Annual Report 2008

Contents

Front cover: "Moolooite Sonata" 2008 - a screenprint collaboration between Paul Liam Harrison and Professor Geoff Gadd for the Designs for Life Project.

Electron scanning electron microscope image of copper oxalate mineral (moolooite) produced by the fungus Beauveria caledonica. The biomineral is produced when oxalate secreted by the fungus dissolves copper-containing minerals, in this case copper phosphate: the oxalate reacts with the liberated copper resulting in moolooite crystallization. Such processes reflect the roles of fungi in transformations of minerals in the environment and the cycling of elements. Some of these processes are relevant to the treatment of environmental contamination by pollutant metals and radionuclides.

Opposite page: Anglo-American Accounting and Finance: Good for Business? Bad for Society? – was the topical Discovery Days 2008 presentation by a prescient Professor David Collison, Personal Chair of Accounting and Society.

Foreword

Even in the early years of the 21st century opinions about the purpose of our universities vary widely. At one end of the spectrum, the utopian view is of a protected community of scholars focused on higher learning and basic research. At the other, the utilitarian view is simply that the skills associated with higher education are good for the individuals who acquire them and good for the economy.

This is an artificial divide – higher learning can combine the fundamental truths with the knowledge and skills required to help the professions, businesses and public services innovate and prosper; and basic research provides understanding and insights that can be applied in tackling environmental and social problems and developing new products and services.

One commentator reflecting on the looming economic recession noted that "--- in grim times we must look to our brains to get us out of the mess". Universities do not have a monopoly on brains but we must always be relevant, competing successfully in the global contest for capital and good people and winning the support of our local communities. We must also play our part in tackling the big issues of our time, creating and sharing knowledge which is relevant to global health, climate change and energy, food and water security.

The 2008 Annual Report underlines the relevance of the University of Dundee in promoting translational research, developing new approaches to professional education, stimulating new ideas and technologies where disciplines intersect and focusing on the challenges of the 21st century. It shows how the University is contributing to the objectives of the Scottish Government and the wider community and how new discoveries and new technologies can actually change society.

2007/8 was a good year for the University with a 19% increase in research activity and a slew of new research awards that will stand us in good stead for the future. The financial review shows the University on a surer footing with a bottom line surplus of £3.5m, an operating surplus of £2.5m, an underlying surplus of £0.9m and borrowings manageable at just over 5% of turnover.

The review also identifies a number of financial challenges for the future and emphasises the importance of continuing to pursue the University's strategy of growing income from research and taught postgraduate education and maintaining costs at an affordable level.

The past year has been a year of hard work, commitment and success and I take this opportunity to thank our staff, students, Court members, funders, partners and friends who make the University what it is today.

Sir Alan Langlands FRSE
Principal and Vice Chancellor

Aspiring to excellence

01

The University mission, first articulated in our Royal Charter in 1967, remains our touchstone today:

> "to advance and diffuse knowledge, wisdom and understanding by teaching and research and by the example and influence of its corporate life."

In pursuing this vision into the twenty first century we emphasise our ambitions for excellence in education, research and knowledge transfer and the creation of an environment which enables staff and students to reach their full potential. Dundee's contribution is distinctive but clearly aligned with the strategic objectives of the Scottish Government which funds about 40% of our activity. An overview of a range of indicators of the University's performance is outlined in the next section, "Measures of excellence".

The University of Dundee's strength lies both in its breadth of expertise and its depth of specialist knowledge. We increasingly recognise the value of "connectedness" across our disciplines and the synergies which exist by having, for example, geographers, lawyers, engineers and scientists bring their individual perspectives to bear on environmental issues; or mathematicians, clinicians, designers and biomedical scientists working together on improving health.
Our college structure encourages that "connectedness", enabling cross cutting activity to flourish wherever the opportunities arise. This interdisciplinary approach is one of Dundee's defining characteristics, encouraged by our tight physical geography and our culture of collaboration. Dundee's cross cutting approach is emphasised in the four themes we have adopted in our strategic vision for the University as:

- a centre of excellence for translational research
- geared to the professions
- inspiring creativity and promoting cultural development and
- tackling contemporary global issues

The 2008 Annual Report will examine each of these themes in turn, illustrating how they fashion our quest for excellence in higher learning, research and knowledge transfer.

Opposite page: Senior professors at the University of Dundee won three of the UK's most distinguished academic awards – the Royal Medals. Only six gold medals are issued each year by the Royal Society (London) and the Royal Society of Edinburgh. Pictured left to right are 2008 recipients: mathematician Professor Roger Fletcher, and life scientists Professor Sir Philip Cohen and Professor Sir David Lane.

Measures of excellence

02

The University has performed well over the last year by a wide range of measures on research, teaching, student satisfaction and awards for merit.

Research measures including citations and awards have confirmed Dundee's performance as first class, particularly in the fields of biomedical science. The Thomson Scientific Index ranked Dundee top university in the UK for research impact, surpassed only by the Institute of Cancer Research. Later in the year the journal, Research Fortnight, placed the University of Dundee in the UK's top 20 based on the value of its research awards. For the first time, we made an appearance in the top 200 universities in the world as ranked by the Times Higher – QS World Rankings 2007 – coming in at number 171, the fastest rising Scottish university. The University's status as a European leader in the impact of its research over the last ten years was confirmed in 2007-08 across a range of biomedical sciences by the Institute of Scientific Information, Philadelphia. Measuring the number of citations per paper, the Institute found that the University of Dundee is first in Europe in pharmacology and toxicology, second in Europe (and first university in the UK) in biology and biochemistry and fourth in Europe (and second in the UK) in molecular biology and genetics. The substantial period of time over which these citations were measured is testament to Dundee's continued strength and development in this important area.

Measuring success in terms of research funding, the University has performed outstandingly, securing more than £100m in research awards over the last 15 months – money which will accelerate understanding and knowledge in a range of areas. Dundee outpaced all UK universities in achieving the biggest rise in share of Wellcome Trust awards over the last two years. The University was also highly successful in achieving research grants and awards from research councils such as the Biotechnology and Biological Sciences Research Council and the Medical Research Council. In responding to the BBSRC competitive funding invitations in 2007/08 the overall success rate for the University of Dundee was 10 percentage points above the national average – with 35% of our bids successful compared to an average 25%. Applications to the Medical Research Council showed a 56% success rate on 16 applications – more than double the average (27%) - a performance surpassed by no other institutions with as many bids. The MRC also rated the proportion of Dundee bids which reached internationally competitive standards among the very highest.

In order to achieve the highest standards of research it is vital to attract and retain the highest calibre of international researchers. The provision of an attractive environment, combining top quality research, colleagues and facilities with an enviable quality of life is a key driver in our strategy. We are pleased to note that the University ranked once again among the world's top five scientific workplaces outside the USA in an international poll of scientists carried out by the Scientist magazine. Dundee has consistently ranked among the highest in this poll over the last six years.

This is also the first year that the University has participated in the National Student Survey and results have been very encouraging, with Dundee placed 13th in the UK in response to the key question "Overall I am satisfied with the quality of my course". The results of the International Student Barometer also showed high levels of positive feedback from students placing Dundee 11th in the UK for overall satisfaction. In the Times Higher Awards 2007, the University was shortlisted for its outstanding support for overseas students. Most recently the University has been shortlisted for the Times Higher Education University of the Year 2008.

University league tables in newspapers are notoriously fickle but the high quality of teaching and student satisfaction is now contributing to excellent placings across a range of disciplines. These include first in the UK for Dentistry (Guardian and Independent) and for Medicine (Guardian). Other subjects to achieve high rankings are: Civil Engineering, Mathematics, Education, Art & Design, Architecture, Law, Geography, Town Planning, Computing, English, History, Pharmacology, Philosophy and Politics.

Our campus, which has been substantially redeveloped over the last few years, has also been recognised with a number of awards. The Dalhousie Building which provides new state of the art teaching facilities has won the Green Gown Award for Energy and Water Efficiency and was named Best Public Building of the Year by the Dundee Institute of Architects.

Dundee's performance was neatly captured in the Sunday Times Good University Guide, which gave the University the following tribute:

> "Dundee is riding a wave of academic success that league tables such as our own struggle to capture fully. This is one of the finest institutions in Britain where researchers routinely push back the boundaries of knowledge and teachers inspire their charges. The winners are the students lucky enough to study here."

Excellence at an individual level has been recognised with a sheaf of awards to students and staff. Space does not permit mention of them all but the following select examples illustrate our aspirations for the highest levels of achievement across our university community.

In a major international competition for student research held in Florence, final year computing student Suzanne Prior took first prize with her project which has developed a way to make computer-based instant messaging accessible to older people. Suzanne overcame competition from other universities world-wide to take the prize. We were particularly delighted to see a team of our design students chosen to represent the UK at the Microsoft Design Expo 2008 in Seattle where they demonstrated their Storymaker/Storyteller machine, which enables users to combine pictures and commentary to create stories developing communication.

Hannah Whaley from the University's Learning Centre secured the title Learning Technologist of the Year for her innovative contributions to elearning. She was recognised for a range of achievements including the creation of an online assessment system which is to be made available commercially to over 3,600 educational institutions worldwide.

In May Professor Dario Alessi was elected as Fellow of the Royal Society bringing the number of FRS currently at the University of Dundee to nine plus four Emeritus Fellows – an extraordinary record for a University of this size.

Further recognition was to come later in the year, when three of our senior professors were awarded the UK's most distinguished academic honours by the Royal Society of London and the Royal Society of Edinburgh respectively. Sir Philip Cohen was awarded the Royal Medal by the Royal Society in recognition of the profound implications of his research. The award came just weeks after Sir Philip was recognised by the US National Academy of Sciences. Mathematician Roger Fletcher and scientist Sir David Lane were selected for two of the three annual Royal Medals - the highest academic awards made by the Royal Society of Edinburgh – in recognition of their achievements which have brought benefits on an international scale. Our "triple gold professors" provide inspiring role models for today's students.

We are extremely proud of all those whose contributions make the University of Dundee what it is today.

A centre of translational research

03

> "The need to close the gap between science and health services has never been greater and the health and economic benefits of doing so, never more inviting."

The requirement to translate basic scientific and clinical expertise into effective therapies – harnessing discovery science to support the development of drugs, devices and new approaches to providing healthcare is central to the University's mission. This is the essence of translational health research – one of the University's greatest strengths – an objective reinforced by the Cooksey Report in 2006 as a key priority for the nation.

Dundee research has enhanced our understanding of major diseases including diabetes, cancer and tropical diseases, improving treatments and developing new drugs. The College of Life Sciences – which works closely with the University's Medical School - now houses one of Europe's most prestigious research institutes, acting as a magnet to attract the world's most talented scientists to Scotland. Our strengths are well established in basic life sciences, biomedical sciences, translational biology, experimental medicine and health informatics which, together, account for more than 80% of our research income. The downstream economic effect is substantial, with life sciences accounting for 16% of the regional economy. The University has a good track record of attracting inward investment and creating spin-outs and currently has contracts with the majority of the world's top pharmaceutical companies and a number of the leaders in biotechnology.

Building on this success the University of Dundee has put translational research at the very heart of its mission and vision, making it a key strategic priority to translate basic and clinical research into local, national and global health benefits. This accords with the Scottish Government's strategic objectives on wealth and health.

To enable businesses and people to increase their wealth and more people to share fairly in that wealth
Scottish Government Strategic Objective 1

To help people to sustain and improve their health, especially in disadvantaged communities, ensuring better, local and faster access to health care
Scottish Government Strategic Objective 2

To make it work we have three fundamental requirements – the highest calibre expertise, state of the art facilities and top quality training programmes.

Clinical Research Centre - one of a handful of places in the world with state-of-the-art clinical imaging and an interventional radiology suite.

The University has a track record of attracting – and retaining – top researchers to Dundee – as detailed in "Measures of excellence". No fewer than 55 countries are currently represented by the 750 staff in the College of Life Sciences alone.

Over recent years we have developed a critical mass of expertise in biomedical sciences and in the last year alone have appointed 23 new professors in the fields of life sciences and medicine. These include several key posts in translational medicine such as the Chair of Pharmacogenomics and the Chair of Translational Biology and Medicinal Informatics. Two further Chairs of Translational Medicine are currently being recruited. Three of our four colleges are engaged in translational research – the College of Medicine Dentistry and Nursing, the College of Life Sciences and the College of Art, Science and Engineering.

This critical mass of expertise at the University now encompasses the understanding of disease at the molecular level through the development and delivery of new drugs and treatments, to the understanding of population health and epidemiology. Major strengths in cancer, diabetes, tropical diseases, drug discovery and health informatics power Dundee's translational drive. New routes to diagnosing and treating illness hold out great promise in areas including the identification of biomarkers of disease, advances in imaging, the development of new chemical compounds, biopharmaceutical and molecular medicines and the prospect of successful gene and stem cell therapies.

Our capital investment programme is geared to this translational research strategy, providing facilities of the highest scientific and industry standards, with expenditure of more than £90m on relevant research platforms in recent years. These include the MRC Protein Phosphorylation Unit, the Drug Discovery Unit, the joint Division of Molecular Medicine, the Laboratory of Medicinal Informatics, the Institute of Medical Science and Technology, the Health Informatics Centre, the Clinical Research Centre, the core laboratories for the Translational Medical Research Collaboration, SINAPSE Neuroimaging Consortium, Tayside Children's Research Facility, Tayside Institute of Cardiovascular Research, and the Diabetes Research Centre and the Scottish National Screening Centre for colo-rectal cancer. Most recently the Scottish Government has awarded a further £10m to develop the Scottish Institute of Cell Signalling at Dundee.

Facilities within these centres are first class, with a comprehensive set of post-genome technologies and technical services organised on a centralised basis to the highest scientific and industry standards. The core laboratory of the Translational Medicine Research Collaboration, for example, provides the DNA microarray, proteomics, metabolomics, immunoassay, bioinformatics and biostatistics platforms required to support over 70 translational medicine programmes across Scotland.

The Wellcome Trust Centre for Gene Regulation and Expression houses over 100 scientists studying how genes and chromosomes are regulated in a combined effort to advance the diagnosis, treatment and prevention of human disease.

The Division of Signal Transduction Therapy works with a consortium of the world's leading pharmaceutical companies and the MRC to translate research on kinases into the development of new drugs using high throughput screening techniques. The Institute of Medical Science and Technology combines expertise from a range of disciplines to develop innovative new devices for use in diagnosis and treatment. Its range of activity extends to creating new solutions in diagnostic and therapeutic imaging, targeted drug delivery, novel methods of cancer treatment, regenerative medicine minimally invasive surgery and image guided therapy.

The new Clinical Research Centre includes a clinical imaging centre housing MRI and PET/CT facilities and an interventional radiology suite with two new Chairs in Clinical Imaging. The Health Informatics Centre provides record linkage of patient data derived from multiple datasets within defined populations such as the Scottish Diabetes Research Network (200,000 patients) and NHS Tayside (600,000) allowing a better understanding of health issues and influencing policy development.

Each of these centres concentrates on a stage of the translational journey from research to clinical practice. New projects such as the Scottish Institute of Cell Signalling and the Scottish Health Informatics Project will build on our translational activities driving new success and development. Dundee's interconnected approach brings together a wide spectrum of expertise, facilities and activity to pursue the health journey from discovery through implication to application. Our aim, to promote integrated care, supporting biomedical innovation, clinical research and major population studies, reflects the conclusions of the Cooksey Report.

This spirit of integration also drives our approach to training. The importance of top quality programmes in developing Scotland's skills pool and ensuring future generations of scientists, researchers and professionals share and develop the latest hard-won knowledge, is well recognised. Training in translational medicine is an institutional priority and this year the University was awarded one of only nine Wellcome Trust Clinical PhD programmes designed to allow the brightest and best medical clinicians to extend their training into basic science and medical research. The first cohort have already started, pursuing predominantly laboratory based projects drawing on the rich opportunities afforded by Dundee's 5* life sciences and laboratory based medicine operations. In addition new training programmes in translational cancer medicine including cancer epidemiology and clinical PhD Fellowships in translational medicine are in the pipeline.

The University is working hard to close the gap between science and health services. Building on our established strengths in both fields we have aligned the vision and strategy with the leadership, expertise, facilities and the training programmes to drive translational research excellence to the next level securing health and economic benefits for Scotland and beyond.

Excellence in translational research

The Division of Signal Transduction Therapy

New funding of almost £11m was confirmed this year for the drug discovery and development operation at the Division of Signal Transduction Therapy (DSTT) bringing the total contributed by participating companies to more than £34m over the last ten years. Sceptics called it a "test tube dream" – the notion of bringing together major rivals, all world leading drug companies, to share basic research in the quest to develop new drugs. But the unique concentration of bio-expertise at the University of Dundee, giving one-stop access to drug targets in almost every major disease, has proved a magnetic attraction. The Division of Signal Transduction Therapy is a collaboration with the MRC and five of the world's leading pharmaceutical companies to accelerate the development of drugs to treat global diseases including cancer, diabetes and rheumatoid arthritis. This year's renewal takes the agreement into a third phase securing 50 posts at the University of Dundee to 2012 and underpinning further life sciences economic activity in the city.

The five companies currently involved in the consortium are AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Merck-Serono and Pfizer – all global players. Bringing rival companies together on this scale, to share the fruits of basic research in this competitive area is highly unusual and the DSTT has been cited as a model for knowledge transfer by the Department for Trade and Industry and won the prestigious Queen's Anniversary Prize for Higher Education 2005.

The DSTT's activity has initiated its own cascading business reaction. Demand for its screening service alone led its capacity to double and spawned the highly successful associate company Upstate Discovery, sited in Dundee by parent US company Upstate. Upstate Discovery was sold at a premium $205 million to the Serologicals Corporation which in turn sold to Millipore Corporation in 2006 for $1.4 billion. Since then the company has added a huge additional laboratory to their premises at Dundee Technology Park moving both their Cambridge assay laboratory and their Milton Keynes distribution centre to Dundee.

The focus of the DSTT research is on kinases and phosphatases which are implicated in almost every physiological process, offering fertile ground for drug development. The laboratories at the University of Dundee comprise the world's largest centre for their study, with nearly 200 scientists and support staff working in this area. Kinase drug discovery accounts for over 50% of global cancer drug discovery and about 30% of the R&D budget of the pharmaceutical industry.

Translational Medicine Research Centre

Taking a radical approach to developing new tests, drugs and treatments by focusing on biomarkers, the Translational Medicine Research Collaboration is a £56m initiative with US pharmaceuticals giant Wyeth, Scottish Enterprise, NHS Scotland and three other universities. The collaboration aims to develop new biomarkers for diseases with which to assess new drugs in clinical trials for oncology, cardiovascular and metabolic disease, inflammation, women's health and central nervous system.

The TMRC's £12m core laboratory is sited at Dundee, providing DNA microarray, proteomics, metabolomics, immunoassay and bioinformatics platforms supporting over 70 translational medicine programmes across Scotland. It adjoins the new state-of-the-art Clinical Research Centre which opened this year. This £15 million facility developed in partnership with NHS Tayside, is the focal point for all clinical research and clinical trials conducted throughout the two organisations and, increasingly, with other NHS partners. The centre also houses the Clinical Imaging Centre – superbly equipped with MRI scanner (with fMRI capability) and a PET/CT facility juxtaposed with an interventional radiology suite - making it one of only a few centres in the world able to conduct interventional studies with both MRI and PET/CT. The top floor of the CRC building is now being developed as part of the joint division of Molecular Medicine, a state-of-the-art research centre integrating groups at the forefront of translational medicine with an international track record on human diseases with a strong genetic basis. An important element of the work focuses on translating discoveries of key pharmacologically tractable pathways into human therapies.

Drug Discovery Unit

The Drug Discovery Unit is a unique not-for-profit facility filling the gulf in developing new treatments for some of the world's most neglected tropical diseases. These kill many thousands in the developing world yet attract little commercial interest from the pharmaceutical industry. By taking drug discovery into an academic setting, the DDU sidesteps commercial pressures, and develops cutting edge research to a point close to trials and application. Funded principally by the Wellcome Trust and with contributions from the Wolfson Foundation, Scottish Funding Council and the European Regional Development Fund, it is the first facility of its kind in Europe and houses all the disciplines and equipment normally associated with the pharmaceutical industry. It is set to produce one preclinical drug candidate every five years to combat neglected diseases such as sleeping sickness, Chagas' Disease and leishmaniasis which kill more than 140,000 each year. Once the drug candidates are found they will be passed on to major partners trying to combat disease around the world. These partners include the World Health Organisation/ Tropical Diseases Research Programme and the Médecins sans Frontières /Drugs for Neglected Diseases Initiative. Teamleaders Professor Mike Ferguson and Professor Alan Fairlamb have been joined by key recruits from the pharmaceutical industry and are confident of success.

Geared to the professions

04

> "Framing our laws, designing and building our cities, educating our children, treating our health problems… professionals shape our societies."

Preparing graduates for the professions is one of the University's key strengths. Dentists, lawyers, doctors, architects, engineers, teachers, social workers, nurses, computer technologists, accountants… the University of Dundee has built a robust reputation for the excellence of its education and training. Over 50 qualifications across a range of professions from civil engineering, computing and architecture to psychology and infection control are currently accredited by well over 30 professional and statutory bodies, helping to fast track Dundee graduates into high salaried professional careers. Around 70% of Dundee students currently graduate into the professions and our record for graduate jobs is among the best in the UK. Scottish Enterprise has predicted that professional jobs in Scotland will expand by 18% by 2017 meaning a requirement for an additional 198,000 post graduates and 138,000 graduates. The University of Dundee is well placed to respond to Scotland's need.

Educating for the professions means ensuring our graduates acquire sound, up-to-date knowledge and skills geared to contemporary practice. It means maintaining close relationships with professional associations and the business world, and continuously reviewing our course material and delivery to ensure they come up to stringent accreditation requirements. It means preparing our students as global citizens, capable of operating in an international environment; equipping them with transferrable skills including flexibility, resilience and entrepreneurship. And it means preparing for a lifelong relationship with our graduates, offering regular continuous professional development and networking opportunities.

Reports by bodies such as the Royal Institute of British Architects and the British Computer Society, following visits over recent months, have highlighted the strength of Dundee's contribution to the professions. The Bachelor of Accountancy for example has the highest level of accreditation possible with recognition from as many as six professional bodies throughout the UK. Law students too are particularly well recognised professionally. From September 2008 law students have the unique opportunity to become qualified to practise in all of the UK's jurisdictions.

Good quality teaching is vital and Dundee's excellent assessment by the Quality Assurance Agency in recent years has inspired new initiatives in teaching and learning, adding value to the student experience. Dundee's sector leading strengths in elearning have contributed to the success of the student portal, My Dundee, which gives students access to learning materials, discussion boards, clubs and many other resources.

Dental students at work on "phantom heads".

Virtually all courses now have a corresponding on-line presence; our on-line assessment system has attracted national awards and international recognition. Our personal development plan is a model for higher education.

This year to emphasise the value we put on good teaching, The Senate Award for Excellence in Teaching was introduced, complementing the long running Honorary Graduates' Award for Innovative Teaching. In the coming year we will extend this by introducing the Chancellor's Award for Lifetime Contribution to Teaching. Students are also benefiting from a number of innovations in learning support such as an extensive generic skills programme, personal writing tutorials delivered by Fellows of the Royal Literary Fund and summer resit schools. Recognising the diversity of potential, Dundee has been a pioneer of wider access since the early 1990s and our approach - a sector model – accounts for well over 1,000 students entering university who would not otherwise have that opportunity. Many have gone on to distinguish themselves with top degrees. Our distance learning programmes attract large numbers and part time study – a particularly attractive option for those in work and seeking to develop - accounts for 14% of our students.

To expand opportunities for Scots to succeed from nurture through to life long learning ensuring higher and more widely shared achievements

Scottish Government Strategic Objective 4

The combination of enterprise and professionalism is a formidable one and over 1,000 students have signed up for the Enterprise Gym since it launched three years ago, taking advantage of training programmes, guest lectures and business opportunities. Academic staff note better performance from students who are members of the Enterprise Gym, and employers tell us they appreciate graduates' awareness of commerce and business issues.

As our strategy has focussed more sharply on taught postgraduate activity, a considerable effort has been directed towards developing the range of internationally attractive programmes geared to Dundee's specialist strengths. In 2008 we launch 27 new taught postgraduate courses - taking the portfolio to well over 100. Most are professionally oriented including a number in niche areas such as prosthodontics, water governance and conflict resolution.

The University's contribution to the professions is not confined to training. Many of our academics serve on professional bodies and Dundee's extensive research also contributes to policy forming nationally and internationally in a wide range of fields including health, social issues, international law, water and flooding, energy and policing and other areas.

In health, one of this year's many examples is the Scottish Patient Safety Research Network a partnership with the Universities of Aberdeen and St Andrews, which is aiming to make the medical experience safer for patients by examining 'adverse events' such as mistakes in drug dosages and determining how they might be avoided.

Similarly using data from clinical encounters and drug prescriptions researchers have devised a model to predict emergency hospital admissions in the over 40s and the valuable role played by professional specialist nurses was highlighted by Dundee research.

In town and regional planning, researchers are leading a major £500,000 Europe-wide project to improve the monitoring of homelessness and homeless policies across the continent and in the School of Education, Social Work and Community Education researchers are working with the University of Durham on the largest randomised controlled trial in education in the UK to study the effectiveness of peer learning in primary schools in English and mathematics.

The Scottish Institute of Policing Research offers another topical example of the contribution of research to professional practice and policy making. Supported by the Association of Chief Police Officers in Scotland, SIPR brings together researchers from 12 universities working in at least 15 disciplines including forensic science, psychology, computing, international relations, criminology and human geography to develop a range of opportunities for research in areas such as community relations, evidence and investigation and police organisation, to help the police meet the challenges of the 21st century. Now in its second year, SIPR is making a growing impact on policing research in areas such as missing people and witness co-operation. Dundee has also made a major contribution to professional police training in the area of disaster victim identification, having now trained several hundred officers from throughout the UK to form part of the new UK Disaster Victim Identification response capability under a contract with the Association of Chief Police Officers. Plans to extend the training internationally to Interpol are currently under development.

The University's input to the professions extends to the activities of Dundee University Press, the University's academic publishing house, which has launched 30 titles in the last four years. Most relate to the professions, with a particularly strong niche in Scots law where texts for practitioners as well as students are well received. Introduction to Law and Legal Obligations has proved a best seller and other titles in energy and aspects of policing including pathology are raising our professional profile.

The professions are integrated into the fabric of our University. The relationship is dynamic and two-way, influencing training and professional practice, research and policy. Dundee continues to develop its contribution to a wide range of professions, creating new courses and programmes particularly at postgraduate level, disseminating specialist knowledge, leading research which impacts on professional practice and policy… and at all times working hard to ensure excellence.

The questions we now need to address are how we build out from our strong core in the professions and extend that most effectively through lifelong relationships which serve the development needs of our graduates.

Geared to the professions

Accountants: The School is working hard to extend its international reach, with a number of partnerships under development and a series of new programmes at under and postgraduate level geared to international finance. Collaborations with other disciplines are also being actively pursued for example in relation to environmental issues with the development of the Centre for Environmental Change and Human Resilience. The new Masters in International Finance has proved particularly popular, attracting around 80 applicants – virtually all international students.

Architects: The Royal Institute of British Architects endorsed the School of Architecture on their recent visit where new programmes include the Advanced Masters in Practice Management and the Masters in Advanced Sustainability in Built Environment aimed at project managers, architects, planners and other professionals.

"*The Board felt that a strength of the School was its mindfulness to embed the themes of professional practice from the start, most notably by ensuring students work in practice within the first term*."

Computer technologists: Graduates in applied computing achieve professional recognition from the British Computer Society and the BCS Accreditation panel have reported very favourably on Dundee, commending a range of aspects including their relationship with industry through the Industrial Advisory Board.

Dentists: In 2008 the Dental School ranked first in the UK in both the Guardian and Independent league tables. Dundee's expertise has been crucial in establishing the new Aberdeen Dental School and developing the curriculum. Meanwhile, a new specialist Masters in Prosthodontics in Dundee has attracted a wealth of highly qualified applicants.

Doctors: Practising clinicians seeking to develop their research credentials are now able to take advantage of Dundee's international standing in the life sciences and medicine through an exclusive new clinical PhD programme funded by the Wellcome Trust. Undergraduate medical students and staff, eager to put theory into practice, have established a new programme of placements in Malawi through which they are contributing to frontline medical care in this impoverished region while completing their training.

Engineers: The Northern Research Partnership – an £8 million initiative to establish groups of research excellence – established a common Graduate School for participants from Dundee, Aberdeen and Robert Gordon Universities. One of the first UKIERI grants awarded has helped to establish a strong collaboration network between Dundee and a handful of Indian institutions to initiate a step change amongst civil engineers in addressing sustainability in concrete construction.

Lawyers: All law students at Dundee now have the unique opportunity to become qualified to practice in all of the UK's jurisdictions with recognition from the Law Societies of Scotland, England and Wales. New agreements, for example with Symbiosis College in India and the new joint LLM in International Commercial Law in partnership with the University of Cergy Pontoise in France are developing law's international reach.

Natural resources executives: Executives in the oil and gas industry are being prepared for senior management roles by The Centre for Energy, Petroleum and Mineral Law and Policy in the first programme of its kind for senior practising managers in the petroleum industry. Topical new areas of specialist study in Earthquake and Offshore Geotechnical Engineering and Water Governance and Conflict Resolution - which offers a unique opportunity to study water conflict management in Dundee and Delft under UNESCO's programme on water - are also attracting significant interest.

Nurses: The University is working hard to instil and disseminate nursing professionalism not just at home but to far flung parts of the world through distance learning. Key countries include Eritrea and Kenya from where over 200 students were registered for study in 2007-08. The Distance Learning Centre (Nursing and Palliative Care) is engaged with students in 17 different countries and holds accreditation from the major nursing bodies – the National League for Nursing Accreditation Commission and the American Nursing Credentialing Centre, as well as the UK Postgraduate Education Authority.

Psychologists: The School of Psychology is reputed for its research in human experimental psychology, particularly in the fields of language and cognition, neuroscience and development, and social psychology. It has recently developed fruitful international links, particularly in Romania and India where a £500k project is being conducted into social identification. Courses geared to psychology professionals include psychological therapy in primary care and psychological research methods.

Teachers and social workers: The range of postgraduate qualifications geared towards professionals in education, social care and educational psychology continues to grow and includes short courses, in-service and staff development courses, taught postgraduate programmes and research postgraduate programmes. The new BA in Professional Development in Childhood Practice – a distance learning, job-based programme – is the latest example of continuous professional development in this area.

Inspiring creativity and culture

05

> "The most creative, fruitful and innovative thinking thrives at the interfaces between disciplines where ideas, technologies and knowledge collide, yielding fresh perspectives and approaches."

Creativity is at the heart of our ability to compete in the modern world. Ideas and innovation drive progress not just in the arts, but in every field. And creativity allied to critical scholarship is a formidable combination. In adopting creativity as one of our guiding themes, we are committing to a culture in which students and staff can explore, develop and test ideas and where accepted ways of thinking can be challenged and improved. One of our earliest and most distinguished professors, Sir Patrick Geddes put it well: "By creating we think. By living we learn."

Another important aspect of creativity is cultural leadership. The importance of culture to general quality of life is well recognised and the University's contribution to shaping contemporary culture at a local, national and international level - often overlooked in the noise of apparently more tangible activities - is extremely valuable. We also play a key role in supporting the creative industries.

'The Scottish Government wants to see a culturally cosmopolitan Scotland, capable of attracting and retaining gifted people, where our creative community is supported and their contribution to the economy is maximised. The creative industries generate more than £5 billion of turnover in the Scottish economy. Scotland has talent in abundance and we need to support success'
Scottish Government Cultural Policy.

A prime mover in the drive for creativity is the University's art school, Duncan of Jordanstone College of Art and Design, whose quest for artistic excellence in its purest sense is clear and uncompromising. Embodying that principle are projects such as Window to the West and New Craft - Future Voices whose impact on culture – nationally and internationally - is something in which Dundee can take great pride. The power of creativity in communicating key issues has been embraced by artists such as Dalziel and Scullion whose work on aspects of the natural environment spanning a period of years has attracted recognition nationally and internationally. They won the 2007 Saltire Award and were the only British finalists for the biennial Artes Mundi 2008 international arts prize.

'More Than Us' 2007 (detail),
Dalziel and Scullion

Duncan of Jordanstone has not allowed its creative activities to be transcribed by traditional boundaries. Its inspired approach to partnerships is increasingly bringing a creative perspective to bear on disciplines more used to operating far from the cutting edge of art and culture in the gritty hinterland of hard science and technology – disciplines including forensics, computing and crop breeding. Collaborations with life sciences have been particularly fruitful opening up a highly effective channel for the communication of science. The development of the Centre for Forensic and Medical Art is another example of the communications potential unlocked through creative partnership. The Face of Bach project in which the head of Johann Sebastian Bach was reconstructed using a bronze skull cast, laser scans and up to the minute computer technology has made an international impact attracting media attention from all over the world. The Institute for Capitalising on Creativity, which recently attracted £1.5m in funding, is a consortium with three other Scottish universities to focus on research relevant to the creative industries.

The interface between design and computing is also vibrant, enhanced by close co-operation on delivering courses such as Interactive Media Design, Innovative Product Design and Interaction Design. This has resulted in a rich harvest of projects such as the stunning interactive exhibition, Forgotten Chairs and a series of practical applications to improve the lives of elderly and disabled people. These include STANDUP – assistive technology to help non-speakers generate jokes and enhance their communication skills - which was selected for display in the House of Commons.

While creativity is most readily identified with art and the arts, creative thinking is clearly an essential part of many other disciplines including the spectrum of humanities, science and technology. Dundee's leading contribution to space technology is one of many examples demonstrating the power of combining creativity, specialist knowledge and technical expertise. In explorations of Mars and missions to Mercury, Dundee technology is playing a vital role. The Space Technology Centre develops systems for piloting autonomous spacecraft and the management of spacecraft data both onboard and on the ground. These are now in use on a range of missions by all the major space agencies including NASA. The range of Dundee technologies includes the SpaceWire communications network used to connect vital data-handling subsystems, planetary landing technology widely used by the space industry and an image processing chip designed for tracking and image feature extraction used in a specialist space navigation camera.

In terms of cultural leadership, in addition to Dundee's influential input to art and design, the University's contribution to European Philosophy and the Humanities more generally, is noteworthy. Plans for a new Arts & Humanities Research Institute, bringing together English, history, philosophy and politics, are further evidence of our belief in the value of "connecting" across disciplines to inspire and enhance activity and build influence. Our input into the literary world has been particularly strong in 2008 with a range of prestigious awards, the success of the Dundee Literary Festival, an increasingly international entry for the Dundee International Book Prize and the continued development of Dundee University Press.

Professor Christopher Whatley and Dr David Robb pulled off an impressive double in winning the coveted Saltire History Book Award and the Saltire Research Book Award with their respective volumes The Scots and the Union and Auld Campaigner: A Life of Alexander Scott. To complete a hat trick for the College of Arts & Social Sciences, Kirsty Gunn, Professor of Creative Writing, won the Sundial Scottish Arts Council Book of the Year Award for her novel, The Boy and the Sea. Building on last year's pilot, the Dundee Literary Festival extended over four days during graduation, attracting sell out audiences and bringing top names including William Boyd, Vivienne Westwood, Douglas Dunn and Ian Rankin and ranked in the shortlist of the Times Higher Education Awards. Meanwhile the £10k Dundee International Book Prize, now in its fifth round, has widened its reputation and reach, attracting over 70% of entries from outside Scotland including 20% from Australia.

Locally, a rich programme of events including public lectures, exhibitions, concerts and literary engagements has added immeasurably to the cultural life of the City attracting record audiences of over 8,000 this year.

To help local communities to flourish, becoming stronger, safer place to live, offering improved opportunities and a better quality of life -
Scottish Government Strategic Objective 3

Inspirational aspects of drug discovery, informatics, cell biology, civil engineering and a host of other fields were well received by audiences at the 2008 Discovery Days in January when 31 of our newest professors presented a fascinating kaleidoscope of their research at the frontiers of knowledge. The impressive line up of top quality speakers for the Saturday Evening Lecture Series, coupled with the first class venue provided by the lecture theatres within the new Dalhousie Building has set a new benchmark for cultural engagement.

Stimulating, enabling and channelling the creativity of students as they learn is one of the great challenges of teaching. Many of our new postgraduate courses have a strong creative element, including Design for Medical Technologies, Forensic Art, Medical Art, and a suite of Media Arts & Imaging courses on specialisms such as sound art and design. But even where creativity is not articulated, our ethos is to make it part of the culture, encouraging discussion, free thinking and debate. And there is plenty of evidence that creativity thrives. The degree and masters shows in a range of disciplines demonstrate the range of sparkling talents emerging from the University and Dundee students have accounted for an impressive range of awards for their work over the year.

Our challenge for the future is to continue to create conditions in which creativity can best flourish – staging opportunities for those in different disciplines to meet, to communicate, to share ideas…to light the touchpaper and step back.

Inspiring creativity and culture

Designs for life

Over the last two years artist Paul Liam Harrison has led a fascinating project working with 11 scientists to explore the process of visualisation. Funded by the Wellcome Trust, Designs for Life has resulted in some stunning artwork and spawned a series of further collaborations.

The intention was to develop new visual representations of scientific data through screenprint. Images of cancer cells, embryonic stem cells electron micrographs of human skin and time lapse movies of nuclear proteins are among the raw materials. Some of the resulting works are abstractions; some literal re-representations of data in another format. Some take on the influences of popular culture; others are shaped by technologies. On one level it makes science more accessible, providing a route into the underlying information contained within the work. On another level it teases out the parallels in process in each discipline. And many of the pieces are extraordinarily beautiful in themselves.

The project also involved work with local groups including school children and resulted in an exhibition, a symposium on the convergence of arts practice and science and is expected to lead to a new contemporary dance work and specially commissioned music.

Quantum dots

A new generation of lasers poised to revolutionise biomedical technology is being pioneered by the University. Research Director Edik Rafailov of Dundee's photonics and nanoscience group is leading a collaboration of 18 partners from academia and industry in developing matchbox size laser systems with astonishing capabilities and low energy appetites.

The new lasers hold the promise of delivering laser surgery so fast that heat has no chance to flow into and damage surrounding tissue. The lasers have the added advantage of being much cheaper to produce and run than traditional lasers.

The new developments are based around a structure called a quantum dot – a custom-built crystal, pieced together atom by atom, to form a cage to hold electrons. This allows designers to define the energy the electrons can absorb and emit. The work has attracted funding of almost £8m from the EU.

Space Technology Centre

Creativity is no less evident in the work of the Space Technology Centre which has made significant contributions in developing onboard data handling within spacecraft; planet landing technology and satellite data reception – all with a commercial aspect. Research is also progressing on system on chip and software development tools. The Space Technology Centre runs the Satellite Receiving Station which collects data from a number of Earth observation satellites for environmental scientists.

Spinout company STAR Dundee Ltd deals with specialised software for the space industry and provides design and consultancy services. Its customer base includes the North American, European, Japanese and Russian space agencies. Dundee's Spacewire technology, which allows onboard computers to communicate with each other, has been used in numerous space missions and Dundee was the location of the 2007 Spacewire conference drawing delegates from both academia and industry.

Further spinouts on Rapid Quality Systems for software developers and StarChip – allowing faster and more efficient chips to be built – are expected in the coming year.

Health informatics and biomathematics

Innovative uses of data and information are another powerful aspect of creativity and the many ways in which health data can be mined and understood is making significant contributions to health and medicine. This philosophy is at the heart of the Health Informatics Centre which brings together a mass of health data from a wide range of sources and uses the unique health identifier pioneered by Tayside to quarry and cross reference information yielding new knowledge. HIC provides information to researchers, the health service and policy makers about the impact of long term illness and the quality and safety of healthcare. Its unique range of clinician-led work programmes is founded on three decades of collaboration between the NHS and the University enabling population level studies with national and international relevance.

Creative thinking is also – perhaps surprisingly to some - an aspect of mathematics where the modelling of biological processes is offering fascinating insights. Among the many processes being tackled in this way are problems in developmental biology, morphogenesis, plant cell wall growth and the theory of pain, solid tumour growth and development; angiogenesis, tumour invasion and metastasis, host-parasitoid interactions, wound healing and transport in soil environments. A blend of analytical and numerical techniques is used in addition to mathematical modelling skills.

Tackling contemporary global issues

06

"Global health, climate change, sustainability, coupled with energy, food and water security… are the main challenges facing the 21st century."

Addressing contemporary global issues is the fourth – and most challenging – of the University's guiding themes. Never before has the world faced such complex and daunting problems on such a scale. How do we prepare our best brains to take up the challenges and think our way towards solutions? A starting point is the development of expertise in key areas such as energy, water and climate change. The advancement of research which has a bearing on global issues is clearly one vital part of the solution process. Increasing the skills pool by developing appropriate courses and training is another. But, perhaps more subtly, universities like Dundee also have the vital capacity to galvanise talent, initiate ideas, lead debate and influence policy. Dundee's emphasis on interdisciplinary collaborations, connected thinking – for example – in engineering with geography, science, law, accountancy and even art, promises innovative new approaches. This pan-disciplinary thrust is captured in a new initiative developing in partnership with the Scottish Crop Research Institute. The Centre for Environmental Change and Human Resilience is Dundee's new gathering point for environmental futures work with ambitious plans to springboard new interdisciplinary projects and create a number of postgraduate studentships.

Water has been identified as one crucial resource likely to be at the centre of future international conflict. Drought, flood and pollution are increasingly exercising populations, raising issues for agriculture, coastal erosion, planning and health to name only a few. The University's UNESCO Centre of Water Law, Policy and Science recognises the need for a joined up approach and brings together geographers, lawyers, policy makers and scientists to develop a new generation of local water law leaders for the world. Their combined expertise is brought to bear in seeking workable solutions for some of the world's most complex and far reaching issues. The only UNESCO Centre in the UK, and one of only 12 water centres internationally, the Dundee centre combines consultancy with research in the field. Examples include a major EU-funded study of water use and needs on four river basins in Costa Rica, India, Vietnam and South Africa. A key tenet of the UNESCO Centre is the recognition that the legal process - water rights, frameworks for allocation, and institutional mechanisms – is at the heart of water issues for the future. With this in mind, the Centre focuses on developing leadership in water law and has recently extended its portfolio to introduce a new LLM in Water Law.

Image from Dundee
Satellite Receiving Station

A recent successful bid to the European Union puts Dundee in the lead of a half million pound project on Sustainable Water Resources Management, in partnership with seven other institutions in Europe and Australia. The project will allow 90 students and 30 staff to swap continents, with the possibility of a range of other collaborations.

Water is also a key issue for Dundee's geographers who have had a considerable influence on public policy, particularly in the area of environmental systems research. Their work on estimating flood risk, sustainable flood management, identifying vulnerable populations, the social costs of flooding and the exposure of the insurance industry informs Scottish Government policy and the EC Water Framework Directive. A major influential report, Coastal Flooding in Scotland: a Scoping Study, recently completed by a team of academics from the School of Social and Environmental Science provides the first systematic study which both assesses the risks and explores the management options.

In a separate development, a British Academy funded study in the School of Law is investigating how linking sustainable development indicators more closely to strategies and legal obligations can improve the way policies are developed, used and monitored. Pioneering research into environmental responses to rapid climate change including sensitivities of glaciers and water bodies, modelling coastal flooding and identifying patterns of pollution dispersal is also making a clear contribution in this area. Meanwhile the Dundee Satellite Station, which has been monitoring the planet from space for nearly 40 years, has built up a rich database of material through which current environmental research themes are informed.

To improve Scotland's natural and built environment and the sustainable use and enjoyment of it

Scottish Government Strategic Objective 5

Moving the focus to the causes of environmental impairment, and recognising the damage caused by aerosols, our scientists are using state-of-the-art optical techniques to trap, size and chemically fingerprint aerosols in order to understand their properties, how they interact with each other and the implications for atmospheric processes and climate change.

Dundee has also made a significant contribution to renewable and power saving technologies and renewable energy is emerging as a key discipline blending expertise in science, engineering, devices, architecture and energy law and policy. The focus is on finding renewable energy solutions to current energy problems and this consortium approach makes the best possible use of collective expertise, placing Dundee in an ideal position to make a major impact on the hydrogen economy.

Our pioneering work in thin film photovoltaics for solar energy conversion is also well known. The use of amorphous silicon, first developed here, has led the world away from power hungry cathode ray tube technology saving trillions of tons of carbon from going into the atmosphere.

Currently Dundee is taking this to the next stage by developing new improved displays of superior quality but requiring even less power – with consequent environmental implications.

Research is also being pursued on solar energy, nanotechnology & energy conversion, low power devices and renewable systems and other significant technologies. In extending and developing this expertise, Dundee is now running an undergraduate degree in renewable energy - one of the first universities to do so - and has established an innovative postgraduate programme in renewable energy and environmental modelling, with strong industrial support and working with key players in the energy sector.

Global health issues such as cancer, diabetes and tropical diseases are addressed on a daily basis in the College of Medicine, Dentistry & Nursing and the College of Life Sciences where drug discovery programmes offer particularly clear examples of Dundee's contribution to tackling world scale problems. These are covered in greater detail in the theme on translational research. Globalisation is also a key topic in economics where research focuses on areas of great contemporary interest such as globalisation and health; national policies and the drivers of the "global value chain" led by Dr Catia Montagna, a key figure in the field.

Research is clearly important in developing solutions but we also understand the need for knowledgeable, well prepared and talented individuals to drive the process. A variety of courses across the university have been developed with this in mind. Courses such as the new MRes in Crop and Environmental Science in partnership with the Scottish Crop Research Institute, the executive masters leadership programme for senior managers in the oil and gas industries, a range of courses in international business and finance, the LLM in water conflict management and the new masters in Advanced Sustainability in the Built Environment, to name just a few.

In preparing our students for careers in a global economy we have, over the last year, developed an internationalisation strategy to underpin the University's aspirations as a world player and to ensure an international dimension to all our students' experience – academic and personal. Key international relationships have been identified and prioritised and extra energy has been diverted into collaborations with partner institutions such as Loyola College and Symbiosis College in India where memoranda were signed this year on economics and law and Nankai Teda University in China where we link up in art and design and engineering. Students as well as staff are taking a hands-on approach to tackling problems in some of the world's most challenging environments including Malawi where medical students are carrying out placements as part of their training and Lesotho – one of Africa's poorest and least developed countries - where the University's nursing staff are working with the National University to develop education, research and information technology skills for healthcare. A new post will be established in 2008 to further our international ambitions - building enduring education and research partnerships, encouraging staff and student exchanges and creating and sharing knowledge which is relevant to global health issues, climate change and energy, food and water security.

Tackling global issues

A range of projects of varying size and scope illustrate Dundee's zest and potential for tackling global issues

Energy saving devices
Energy saving in electronic devices is an essential component of the new energy landscape and Professor Merv Rose is developing an innovative manufacturing process which has delivered a new field emission technology that operates at low voltage giving an emissive display technology using less than 10 watts. This technology also has application in low power solid state lighting.

Power of fungi
The potential for fungi to be used in mopping up deadly pollution is highlighted by the research of Professor Geoffrey Gadd, featured on the front cover. His work shows evidence that fungi can lock depleted uranium into a mineral form less likely to find its way into plants, animals or the water supply.

Cutting CO_2
A university start-up company is developing an ultra low emissions motor engine which will cut CO_2 emissions by a quarter. Oxy-Gen Combustion Ltd won a Shell Springboard award of £40,000 to take the new engine to pre-production prototype. The technology, Homogeneous Charge Compression Ignition (HCCI), is believed to be the stepping stone between present motor engines and hydrogen and fuel cell technologies of the future. Not only will it cut emissions, it is expected to be up to 25 % more efficient.

Understanding aerosols
Aerosols have a huge impact on the environment and one group led by David McGloin is developing optical tools to trap and probe single aerosol droplets to understand how they interact with each other and their immediate environment. Using a suite of optical technologies they are able to trap, size and chemically fingerprint aerosol droplets and follow changes in their properties.

Algae for biofuel
The potential for algae as a future source of mass biofuel is highlighted by Professor Geoffrey Codd whose work in this area is widely known. Algae do not compete for land use with food production, show high growth yields and could be a viable source of sustainable fuel.

Advising governments

The Centre for Energy, Petroleum and Mineral Law & Policy delivers advice and training to governments and bodies throughout the world on energy issues. Creating new energy infrastructure in developing countries; international arbitration and advocacy and contract and fiscal stability are among the many topics on which they deliver international training for professionals.

Water

The "global water crisis", one of the most important global challenges, is becoming ever more critical with climate change, the world economic downturn, and problems of food and energy security. Effective responses require innovative approaches to managing the world's water.

Dundee's contribution, through the UNESCO Centre sited here, has brought unique expertise to bear, influencing approaches to the management of the world's water resources at national, regional and international levels through its research and policy inputs. The Centre has placed "water law" on the international water policy agenda providing water law input to the UNESCO International Hydrology Programme which covers some 191 member states. It contributes on water law policy to the Global Water Partnership; to the wider international community through the World Economic Forum and to all 24 agencies that deal with water. Professor Pat Wouters serves on a wide range of influential bodies including the GWP Technical Experts Committee, the intellectual leadership of the GWP.

Its innovative specialist training - Water Law, Water Leaders – will build capacity and foster a new generation of local water leaders – champions around the world with the capacity and networks of support capable of responding to these challenges.

Solar/wind hybrids

Closer to home engineering students on the Renewable Energy and Master of Engineering programmes have recently put theory into practice by building a wind turbine complemented by home-made solar panels and associated battery management systems for the Harris Building, giving their laboratory a totally green standard AC outlet. Other projects include the installation of hybrid solar/wind technology to light Dundee's Magdalen Green Park and wind turbines on Gayfield Park the home of Arbroath Football Club.

Recognition of excellence

07 staff

Professor Eric Wright won the Weiss Medal and presented the Weiss Medal lecture at the International Congress of Radiation Research in San Francisco.

Professor Alan Vardy was elected Fellow of the Royal Academy of Engineering, the highest honour accorded to British engineers.

Dr Miles Witham was awarded the prestigious Scottish Clinical Scientist Award for 2007 from the Chief Scientist Office of the Scottish Government.

Dr Andrei Nikolaev won the 2006 Royal Society of Chemistry Award in Carbohydrate Chemistry.

Professor Kirsty Gunn was awarded the Sundial Scottish Arts Council Book of the year 2007 fiction award for 'The Boy and the Sea'.

Sander van Kasteren, recently qualified postdoctoral researcher, was one of 20 of the UK's most promising young biomedical scientists selected for the first Sir Henry Wellcome Postdoctoral Fellowships.

Matthew Dalziel & Louise Scullion won their second Saltire Society Arts & Crafts in Architecture Award for their permanent video installation at the new headquarters of HBOS in Edinburgh. They were also the only British artists to be short listed for the prestigious Artes Mundi Prize.

Vice Principal Professor Christopher Whatley won the 2007 Saltire Award for Scottish History Book of the Year with The Scots and the Union.

Dr David Robb won the 2007 Saltire Award for the Best Research Book with his literary biography Auld Campaigner: A Life of Alexander Scott.

Four members of the teaching staff were awarded the Honorary Graduates' Prize for Innovative Teaching: **Graham Pullin**, School of Computing & School of Design, for "The Museum of Lost Interactions"; **Mrs Hannah Whaley**, Learning Centre, for "Groupwork Assessment System" and **Dr Martine van Ittersum** & **Dr Matthew Ward**, School of Humanities for "Weblogs in History Teaching".

Professor Angus Lamond and his colleagues were awarded Wellcome Trust Centre status for their work on gene regulation and expression. He also won an award for his laboratory webpage. It was named one of the ten best in the world by the prestigious journal `The Scientist' in their inaugural Laboratory Web Site and Video awards.

Oxy-Gen Combustion Ltd, a University start-up company led by MD **David Tonery** won a Shell Springboard award of £40,000 for their project to develop an ultra low emissions motor engine.

Professor Sir Philip Cohen achieved two major awards in quick succession. In June he learned he had received the highest academic award in the US - election to the US's National Academy of Sciences. Only weeks later he was awarded the Royal Society of London's prestigious Royal Medal – the UK's highest academic accolade given in recognition of the profound implications an individual's research findings have for others.

Professor Dario Alessi was elected Fellow of the Royal Society – at 40, one of the youngest to achieve this prestigious academic accolade.

Professor Mike Ferguson world-renowned specialist in the biochemistry of tropical diseases received a CBE from HM the Queen for his services to science.

Professor John Cummings, Emeritus Professor of Experimental Gastroenterology was honoured with an OBE for his contribution to medicine and nutrition.

Professor Sue Black received the Humanitarian Award – the Lucy Mair Medal for Applied Anthropology from the Royal Anthropological Institute. The Lucy Mair Medal is awarded to honour excellence in the application of anthropology to the relief of poverty and distress, and to the active recognition of human dignity.

Professor Roger Fletcher, mathematician and **Professor Sir David Lane** bioscientist were presented with prestigious Royal Medals by His Royal Highness The Duke of Edinburgh. The Royal Medals were awarded by the Royal Society of Edinburgh to recognise achievements which have brought about benefits on an international scale.

Professor Grahame Hardie, was selected for the 2008 Rolf Luft Award from the Karolinska Institute and the Rolf Luft Foundation for Diabetes Research for his discovery over twenty years ago of the enzyme AMPK.

students

John McGhee, PhD student and 3D graphic artist was nominated as a Morgan Stanley Great Briton of 2007 recognising outstanding achievement over the last year for his development of a series of 3D computer animation tools for use in health areas.

Graduates from the University of Dundee's School of Media Arts and Imaging were among the winners at the Royal Television Society Student Awards for Scotland. **Jen Randall**, won the Undergraduate Drama award for her film, `RAT' and **Andy Sim** was runner-up in the same category.

A team of students of town and regional planning won the annual Planning magazine quiz for the third time in five years. **Cathy Archibald, Shona Simpson, Graeme McCarthy and James Wilson** beat contemporaries from across Scotland and Ireland to capture the £500 prize. All four of the team are students on the taught postgraduate European Urban Conservation programme at Dundee.

Garrie Watson, town and regional planning student, won the Dundee Civic Award 2008 for his proposal for an exhibition and conference centre at the site of the Tesco distribution centre at Kingsway West.

Sarah Gillespie, first year art student, won the Enterprise Gym award for her creativity and enterprise in getting her singer songwriter career started.

Steven Blane and **Bruce Langlands**, law students made it to the world finals of the Louis M Brown International Client Counselling Competition in Bangalore where they took third place. The pair represented Scotland and competed against seventeen teams from around the globe.

Suzanne Prior, final year computing student won first prize in a major international student research competition in Florence - ACM SIGCHI Conference on Human Factors in Computing Systems. She was later awarded the Wimberley Prize by the University given to the student who has made the most distinguished contribution to University life.

Ross Whiteside, civil engineering student, won a prestigious Royal Academy of Engineering Advanced Leadership Award.

A team of engineering students were recognised in the Formula Student competition, run by the Institute of Mechanical Engineers, which challenges students to design and build a Formula-style racing car. Members of the DRIVE team - Dundee University Race Innovation and Vehicle Engineering – led by **Gareth Davies** won the Cost section of the competition for the chassis they designed and built.

A team of students studying innovative product design and interactive media design – took their project to the Microsoft headquarters in Seattle where they were the UK's sole representatives in the Microsoft Design Expo 2008. **Natalie Montgomery Lee Murray, Neil Dawson** and **Joanna Montgomery** developed a `Storymaker/Storyteller' machine, enabling users to combine pictures and commentary to create stories.

Martin Dempster, postgraduate computing student presented his project at the International Conference on Computers Helping People with Special Needs, held in Linz, Austria.

Two 2008 physics graduates from the University of Dundee took their honours projects to international audiences after their work was recognised by two of the biggest events in their field: **Matt Mullan** presented a paper at the 30th annual international conference of the IEEE Engineering in Medicine and Biology Society in Vancouver.

Pauline Axford presented a paper at the Society for Optical Engineering's conference in San Diego, the largest optical sciences and technology meeting in North America.

Alison Thomson, interactive media design graduate was invited to display her final year project work at the 7th Shanghai Biennale, a huge event which brings together artists and designers from all over the world.

Wendy Houvenaghel, who graduated from the University as a dentist in 1998 won a silver medal in the Olympics for track cycling.

university

The Dalhousie Building was named Best Public Building of the Year by the Dundee Institute of Architects and won the Green Gown Award from the Environmental Association for Universities and Colleges for its energy and water efficiency.

The University of Dundee was shortlisted in the Times Higher Awards 2007 for Outstanding Support for Overseas Students with particular strengths in the **Students' Union, Counselling and the Finance Office**. The University was also shortlisted for the Literary Festival launched in June.

The University of Dundee was, once again, named one of the world's most attractive workplaces in an international poll of scientists. The Scientist magazine's annual poll of more than 2000 scientists placed **Dundee fourth among the Top 10 international institutions** outside the United States.

The University was **ranked 8th in the UK**, and **third in Scotland** for the quality of student life, measured across a range of factors by Times Higher Education.

The University of Dundee was **ranked 11th in the UK for "overall satisfaction"** by the International Student Barometer. The ISB surveyed students at 84 institutions taking their views on everything from teaching quality to accommodation and support services.

The University of Dundee has been granted **Fairtrade status** by the Fairtrade Foundation. The granting of the status comes after a combined effort by the University and the Students Association to stock Fairtrade-approved goods wherever possible

08

Scope of the financial statements

The financial statements, presented to the University Court, have been prepared on a consolidated basis and include results of the University of Dundee and its subsidiary companies. Details of the Group are listed within note 32 of the financial report.

Results for the year

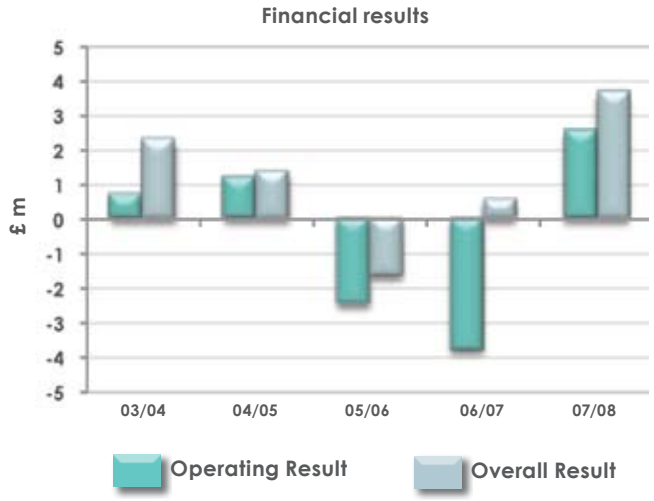
The results for the year are encouraging with the University producing both an operating and an overall surplus, a considerable improvement on last year. This has been achieved through a combination of improved income generation and cost management. The group's summarised results are as follows:

	07/08	06/07
Income	191.4	175.8
Staff costs	(113.0)	(108.9)
Non staff costs / depreciation / interest	(75.9)	(70.7)
Operating result (before exceptional items)	**2.5**	**(3.8)**
Restructuring costs / exceptional costs	(3.8)	(2.2)
Gain on disposal	5.8	7.0
Associates / endowments	(0.9)	(0.5)
Surplus for the year	**3.6**	**0.5**

During the year the University published its Strategic Framework to 2012, which was approved by Court, and provides a guide for the University as it delivers its mission in a complex and challenging world. This Framework incorporates a number of key targets which will enable the University to deliver its academic mission and ensure its long term financial sustainability.

The University has set itself the target of achieving a sustainable surplus of 3% of total income by 2012. This result represents a significant step towards achieving this but there are many challenges ahead.

The chart below illustrates the recent developments in both the operating position of the University and the overall surplus. The underlying operating surplus of £2.5m equates to 1.3% of total income.

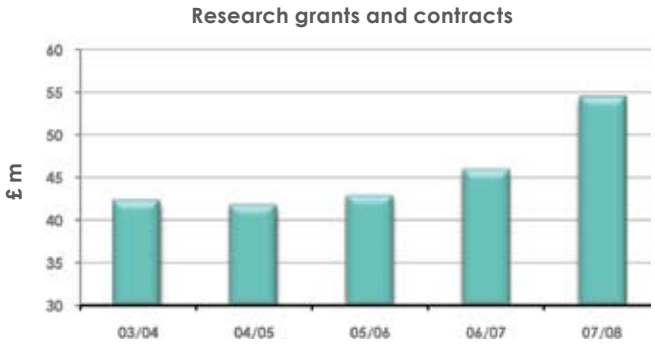


Income

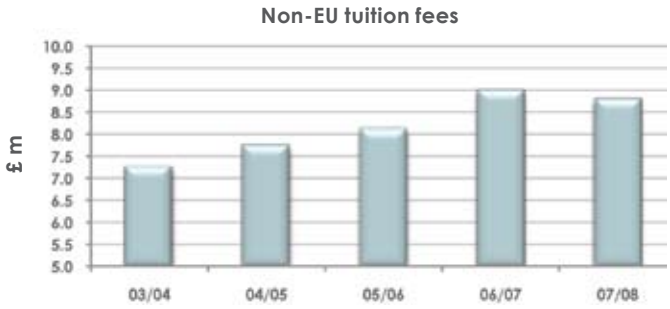
Income increased by 9% in the year with particularly strong growth in research grants and contracts, up 19%. Income received from the Scottish Funding Council (SFC) increased by 12% and represents 40% of total income. This increase is partly the result of the transfer in funding for the nursing contract from education contracts; the underlying increase is 8%. Tuition fees and education contracts, when adjusted for the transfer, rose by 3%.

In order to achieve its strategic goals, the University has set itself demanding income growth targets for research and tuition fees, in particular postgraduate and overseas income.

Research income rose rapidly in 2007/08 and was above the strategic target set for the year. This growth was the result of increased income from the Research Councils and UK charities and substantial increase in other areas including the Translational Medicine Research Collaboration (TMRC) and the continued success of commercial contracts such as the Division of Signal Transduction Therapy (DSTT). Measuring the grant income awarded over the year also gives a positive picture with over £80 million of awards made underpinning future research income.



In recent years, the University has benefited from steady growth in overseas tuition fees income, in particular for postgraduate courses. However, in 2007/08 non-EU tuition fees saw a 2% reduction and were, therefore, below the strategic target for this area. A number of actions were taken and, as a result, improvements are expected in 2008/09 to bring the University back into line with its growth targets.

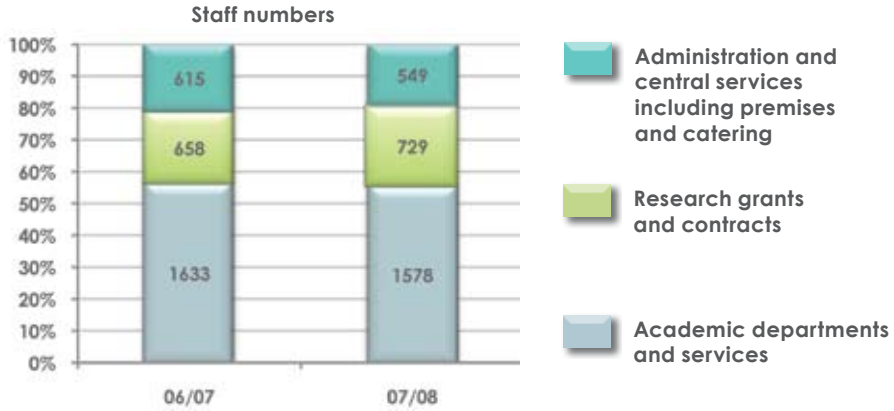


Expenditure

Total expenditure increased by 5% in the year before exceptional items. The most significant increase was in depreciation; this was partly driven by the capital programme, but the increase was in fact largely offset by a compensating increase in deferred capital grants release.

Staff costs increased in the year by 4% and represent the largest element of expenditure accounting for 60% of the total. As a percentage of total income, staff costs have fallen in the year from 62% to 59%.

Staff numbers decreased in the year by 2%. There has also been a change in the staff profile with a higher proportion of staff directly employed in research as a consequence of increased research activity and a reduction in core staff numbers as a result of the voluntary severance programme. The diagram below illustrates this change as well as providing the absolute numbers by category.



In recent years, our human resources strategy has been focused on modernisation, with the implementation of the framework agreement as a key priority. The revised pay scale for all staff was implemented from August 2006 and the job evaluation process was completed (excluding appeals) during 2007/08. The final stage of the agreed three year pay settlement is to be paid from October and is based on the retail price index; as a consequence there will be considerable upward cost pressure on staff costs, including pension costs, from 2008/09 onwards.

The Group gives full consideration to applications for employment from disabled persons. Where existing members of staff become disabled, it is the Group's policy wherever practicable to provide continuing employment under normal terms and conditions and to provide training and career development and promotion to disabled employees wherever appropriate. The University is actively engaged in improving equality and diversity awareness of its staff through training, including elements relating to disability.

Other operating expenses have increased by 0.5% in the year, showing excellent cost management across the University. The main increases have been in research-related expenditure and premises, offset by savings made elsewhere. The current year will see increased utility costs, although the University continues to target energy savings through a combination of building design and increased awareness.

In the year 2007/08 the University incurred costs of £3.8m related to the voluntary severance scheme first launched in April 2007. This scheme has generated significant savings in year and will deliver ongoing cost savings.

During the year the University continued with its property disposals programme, realising gains of £5.8m in the year from surplus property, predominantly old residences.

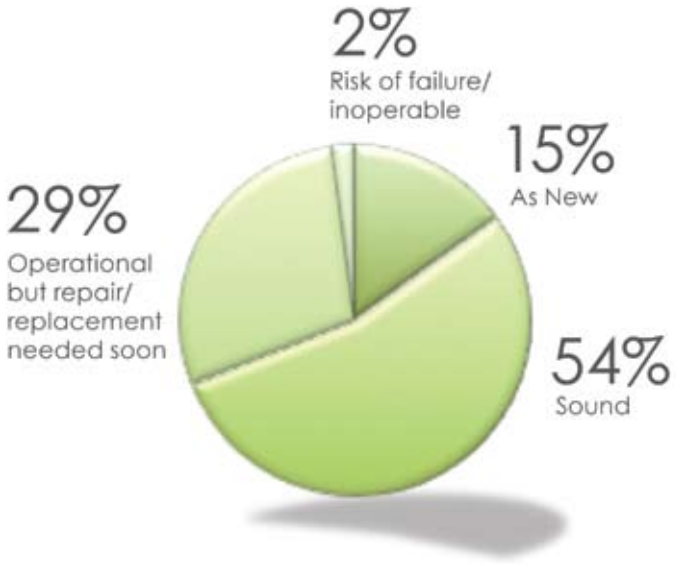
The overall surplus for the year of £3.6m also takes account of the University's share of the result for Dundee Student Villages (DSV). DSV is a separate entity which was established to build and operate the University's residences. In line with the DSV operating model accounting losses are expected during the first years of operation.

The University continues to face many challenges to achieve its target 3% surplus by 2012. There is increasing competition to attract both students and research funding. There are also uncertainties surrounding public funding, in particular the Research Assessment Exercise (RAE) and the effect of this on funding levels. In addition, the University is having to deal with significant cost pressures, in particular as a consequence of the implementation of the final stage of the pay settlement and rising utility costs. All these factors mean that 2008/09 will be a challenging year for the University as it looks to maximise income generation and tightly manage its costs.

Capital expenditure programme

The University campuses are now seeing the benefit from the capital programme launched some five years ago. The cash expenditure on land and buildings was £30m in the year which was offset by external capital grants of £12m and disposal proceeds of £6m. Significant buildings completed in the year include the Dalhousie building which provides new state-of-the-art teaching facilities, the library extension and the improved sports and exercise facilities, along with key research-related projects such as the Clinical Research Centre on the Ninewells Campus.

The University published its Estates Strategy during the year. The top priority of the Estates Strategy, and one which is embedded in the Strategic Framework, is to maintain the campus to the highest possible standard. This is to be measured by the proportion of the estate by floor area classified as new or sound. This currently stands at 69%, as illustrated below, and the target is to increase this to 80% by 2018. This is to be accomplished through a combination of upgrading existing buildings and continued investment in new facilities.



Treasury and investments

The net cash flow from operating activities in 2007/08 was £15.7m, compared to the previous year of £17.2m. In both years, operating cash flow has been greatly enhanced by working capital movements and, in particular, creditors which increased by £10.7m in 2007/08 and £16.4m in 2006/07, largely driven by increased research activity.

The high operating cash flow exceeded the net capital expenditure in year such that borrowings were reduced from £15m to £10.5m and net debt fell from £9.7m to £4.7m.

The University seeks to support the code of good practice in its relationship with suppliers. It is the Group's policy that payments to suppliers are made in accordance with those terms and conditions agreed between the University and its suppliers, provided that all trading terms and conditions have been complied with. At 31st July 2008, the Group had an average of 24 days' purchases outstanding in trade creditors. Interest paid under Late Payments of Commercial Debts (Interest) Act is nil.

The University has in place a revolving credit facility of up to £25m and access to an annually renewable £9m credit facility. In addition, it has a separate £9m facility to support the development of the TMRC building. The nature of the revolving credit facility allows the University to keep cash balances to a minimum and thereby reduce borrowing requirements.

Investments were adversely affected in the year by IDMOS PLC which went into liquidation in February 2008; consequently the remaining investment was written down from £0.8m to zero against the revaluation reserve.

Endowments increased by £1.9m, due to the transfer of £3.4m of expendable endowments from creditors following the introduction of the new SORP. Excluding these transfers, the value of endowments fell by £1.6m to £14m. This reflects adverse movements in the stockmarkets. Management of these investments continued in the hands of independent fund managers whose performance is monitored by the University's Finance & Policy Committee.

Pensions

The main pension schemes of the Group are the Universities Superannuation Scheme (USS) and the University of Dundee Superannuation Scheme (UODS). A detailed statement of these schemes is shown in Note 31 of the financial report which has been prepared in accordance with FRS 17.

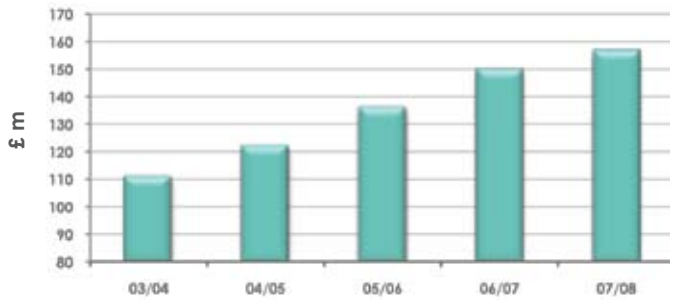
The liability on the UOD scheme has increased from £12m to £20m in the year, largely as a consequence of lower than expected investment performance and a revision to the longevity assumptions. The triennial valuation of the scheme is underway.

The USS scheme is also currently undertaking its triennial valuation, the results of which are expected to be announced during the 2008/09 financial year. The outcome of this and the UODS review could have significant cost implications for the University going forward.

Balance sheet

The net assets of the group fell during the year from £137m to £136m due to the increased pension liability. However, if we exclude this liability, net assets have risen by £7m to £156m largely as a result of the capital programme offset by increased creditors. As the chart below illustrates, net assets excluding pension liabilities have increased substantially (£46m) over the past five years due to the increased investment in fixed assets. Over the same period, net debt has risen by £8m but is in fact lower than at July 2004; this is a consequence of the significant external funding raised for the capital programme and the reduction in working capital due to the research-related increase in creditors over the past two years.

Net assets excluding pensions



Net current liabilities have risen significantly in the year from £20m to £36m as a result of continued improvements in working capital management and increased research activity.

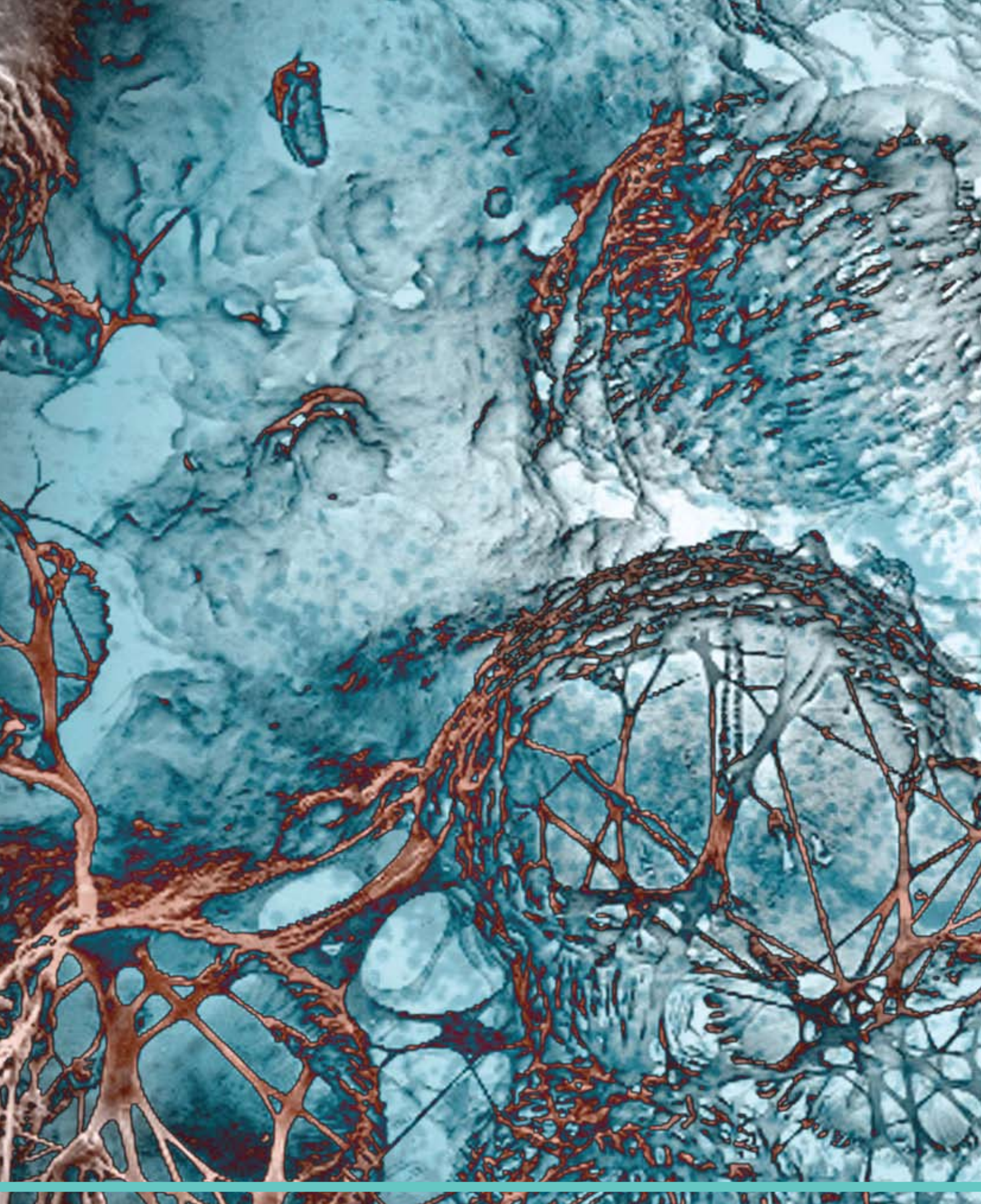
Going forward, the University will continue to manage its capital investment plans effectively and will monitor working capital. Growth in working capital has had very significant cash flow benefits over the last two years, but requires continued improvement in activity levels if it is to be sustained at current levels.

Conclusion

The financial performance for the year was a considerable improvement on the previous year. This reflects the hard work of staff across the University in increasing income and managing costs. The clear lines of accountability established for the academic management of the University through colleges and schools and excellent cooperation between finance staff across the University have played an important part in improved performance. This has provided the University with a good foundation for achieving a sustainable 3% surplus which would enable new academic initiatives and cushion the University against new cost pressures and/or a downturn in public spending. There are clearly uncertainties around the economy and public funding as well as significant cost pressures which will make for a challenging future for the University and the higher education sector as a whole. The University will continue to respond by striving for excellence in higher learning, research and knowledge transfer – maximising income and ensuring the efficient use of resources in the future.

John R Milligan CBE
Chairman of Court

Sir Alan Langlands FRSE
Principal and Vice Chancellor



University of Dundee
Dundee
DD1 4HN

tel +44 (0) 1382 383000
web www.dundee.ac.uk