annual review

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This has been a year in which Keele has seen some very significant achievements and solid development, whilst in a period of challenge as Higher Education in the UK faces its biggest time of transition for many years.

Keele has been carefully planning to respond to this period of change with the twin objectives of growth and distinctiveness across a wide range of teaching and research activities. The KEELE2006 change management programme was initiated to respond to the external environment and to maintain Keele’s position as a vibrant, high-quality, research-led and enterprise-driven university, which provides an excellent education for its students.

To meet the challenges ahead Keele has moved to a three faculty structure: Health, Humanities and Social Sciences and Natural Sciences faculties will have greater responsibilities and will be supported by enhanced leadership and management. There are also fewer, larger Schools within the University to manage the educational programmes and Research Institutes have been formed as the focus for managing and developing research.

This reorganisation followed an extensive period of consultation throughout the University which assessed not only the strengths and anticipated challenges which lie ahead but also the future long-term course the University intends to take. Aligned to this has been the updating of the University’s Strategic Plan for 2005-2010, which is a vital tool as we move forward.

Our successes during the year have included our selection as lead partner to run the Science Learning Centre, West Midlands, as part of a £51 million initiative by the Department of Education and Skills and the Wellcome Trust to create a national network of Science Learning Centres. In the national competition to the Higher Education Innovation Fund, Keele was awarded funding for its total bid which is enabling a significant expansion of work with business and knowledge transfer to both public and private sector organisations.

Our reputation nationally has been enhanced by a series of reports and league tables published by the national press during the year. A report in the Daily Telegraph based on HESA’s performance indicators placed Keele in “an Ivy League” of 12 universities which had a graduation rate of 90 per cent or more and one of the lowest drop-out rates in the country. Figures produced by the Times Higher Education Supplement recognised Keele as one of the fastest growing universities in the UK, while the University moved up 13 places in the Times Good University Guide and the Guardian University Guide.

Our Widening Participation team have continued to organise very successful residential schools, masterclasses and other events to inform youngsters throughout the region about the opportunities in Higher Education. Their success was underlined when they were presented with the prestigious British Interactive Media Association Grand Prix Award for the interactive CD-ROM, Futureproof, which they produced for Key Stage 4 school pupils with the aim of raising their aspirations.

The University’s work in health and medical subjects continues to expand, with students now in all five years of the undergraduate medical programme and a thriving research programme running alongside it.

The year also saw the opening of the MED IC4 building on the Science and Business Park. It is one of the two high-specification medical technology innovation centres, part-funded by Advantage West Midlands and delivered by Keele Park Developments, the joint venture between Keele University and Pochin’s plc, to underpin the emerging medical technology cluster in the area and support local and regional economic regeneration.

Professor Janet Finch
Vice-Chancellor
Report of the Dean

In this year’s report, I should like to reflect on how much the Faculty has changed over the last five years and how significant a contribution to this has been the provision of new buildings.

In September 2002, the new building on Keele campus first responded to the arrival of Year 1 medical students. It was also the culmination of a long period of fundraising to provide a base for the research staff in the Institute for Primary Care and Health Sciences. This building differs from the majority of university buildings in that it has academics working in open plan areas, deliberately separating teaching and research facilities and has endeavoured to have a central atrium and supporting lecture theatre and seminar rooms for the use of external conferences.

The operation of this building has generally been very successful and, in particular, has provided the opportunity for students of Nursing, Midwifery, Physiotherapy and Life Sciences to benefit from the highly praised anatomy learning suite. The teaching laboratories for practicals around biochemistry, physiology and microscopical imaging are shared by the Schools of Medicine and Life Sciences and serviced by technical staff from both Schools. The links with Life Sciences are further enhanced by the Medical School providing funds for approximately 10 bioscience staff, who have teaching commitments in both schools in return for teaching expertise provided by life scientists on the medical course. This collaboration also benefits from the improvements to the research facilities in proximity to the School of Life Sciences, which are where the new medical school academic staff have their research base.

On the clinical campus at the University Hospital of North Staffordshire, the Clinical Education Centre came into operation in September 2004 to complement the School of Nursing and Midwifery, the undergraduate elements of Keele University’s School of Medicine and the Regional Postgraduate Dean’s provision for Postgraduate Medical and Dental Education. This clearly can allow sharing of facilities, staff and teaching sessions between the professional groups in a way which would previously have not been possible. The new building provides a striking statement of the Teaching Hospital status of the Trust and a flavour of the changes which will occur under the Fit for the Future Project, which will see a major transformation of the City General Hospital site and the eventual closure of the Central Outpatients and Pathology Departments at Hartshill.

However, the Hartshill area will not be devoid of clinical academic activity because it has been decided this was the most appropriate location for providing clinical and laboratory research facilities. This site already included the research buildings provided by the Medical Institute and Keele Development Trust. Agreements were reached that the sensible way forward was to build an extension linking the two most modern buildings, as the first phase of the development of research facilities at the University Hospital to support the expanding medical school. The opportunity was taken to move the School of Medicine’s postgraduate education section onto the City General Hospital site to be closer to the Clinical Education Centre and the Medical School Building.

On occasions over the last five years, it has felt like a complex game of chess trying to shuffle the pieces across the board as the various new initiatives come on stream and pots of new funding become available. Inevitably, some compromises have to be made but, in general, the approach has been adopted of endeavouring to mark out particular locations for certain types of activity and then to build in phases. This has led to the separation of the education and research facilities on the hospital campus, partially because of the pressure on space at the City General Hospital site but also influenced by the location of existing serviceable research buildings at Hartshill. It is recognised by all involved in these decisions, that it is essential that strong efforts are made to ensure that researchers, teachers and clinicians remain in close communication in order to achieve maximum benefits from the growing number of academic staff on the hospital site.

Sometimes the “new” facilities are a result of high quality refurbishment rather than new build. This is planned to be the case for the evolving School of Pharmacy which, it is hoped, will be formed in September 2005. The School will be within the Faculty of Health and incorporating the Medicines Management activity. It will arise as a result of setting up a new undergraduate pharmacy course for what will become a total of approximately 320 students. This is a joint venture between the Faculty of Health and Faculty of Natural Sciences, with a major input from the staff in Chemistry and Life Sciences.

Four new buildings and two significant refurbishments have almost totally changed the fabric of the Faculty of Health over the last five years. On the University campus, it not only provides a major physical presence but is also tangible evidence of the integration with the Faculty of Natural Sciences. On the clinical campus, the collaboration between the University and the Hospital is epitomised by the two buildings straddling the new hospital entrance; one is labelled Keele University Medical School and the other is the Clinical Education Centre, which operate jointly to provide education facilities for undergraduate and postgraduate students from all health disciplines. It is with great satisfaction that a strategy devised in 1999 has come to fruition so rapidly.

Professor Susan A. Dilly
Dean of the Faculty of Health

The Department of Education and Skills announce that Keele is selected as the leading partner to run the Science Learning Centre, West Midlands, with responsibility for delivering high quality Continuing Professional Development for science teachers and technicians.

Professor Maggie Pearson, Deputy Director of Human Resources, Department of Health, is appointed Deputy Vice-Chancellor. With the DoH, Professor Pearson had lead responsibility for policy on learning and personal development across the entire 1.3 million NHS workforce.

Three new research institutes within the University’s Faculty of Health are launched at a special ceremony at the Undergraduate Medical School on campus. They are the Institute of Primary Care and Health Sciences, the Institute of Ageing and the Institute for Science and Technology in Medicine.

Professor Alicia El Haj and colleagues within the Cell and Tissue Engineering group of ISTM are successful in the VIth Framework European funds. The group is part of a Network of Excellence, EXPERTISSUES (Novel Therapeutic Strategies for Tissue Engineering of Bone and Cartilage using Second Generation Biomimetic Scaffolds), which has been awarded seven million euros for a four year programme.
Fighting asthma

Professor Warren Lenney, Respiratory Paediatrician at the University Hospital of North Staffordshire and Keele University and Director of the North Staffordshire Research and Development Consortium, and Professor David Smith, Institute of Science and Technology in Medicine at Keele, are working together in a bid to discover a non-invasive way of trying to find out what is happening in the lungs of children suffering from asthma.

Asthma affects one in seven children in the UK, making it the most common chronic disease in childhood. For doctors, one of the biggest problems with youngsters suffering from asthma is determining exactly what is happening inside a child's lungs.

Professor Smith had developed Selected Ion Flow Tube Mass Spectrometry (SIFT-MS), which is a new technique enabling rapid identification and quantification of gases in exhaled breath. The machine had already been used for clinical diagnosis and therapeutic monitoring in collaboration with clinicians, surgeons and cell biologists in the Keele Medical School and at the University Hospital of North Staffordshire. Professor Smith has found that when a patient is generally unwell components in their breath change and these changes can be detected by the SIFT-MS machine.

Now Professor Smith is working on the development of a “mini-machine” which can be used to test the breath of young children.

“Obviously with a child we cannot use invasive techniques to see what is going on in their lungs,” explained Professor Lenney. “We would like to use Professor Smith’s machine to give us a lot more information about what is happening inside the chest.

“We know that there are children who have asthma-like symptoms of coughing and wheezing which disappear at the ages of six, seven and eight and there are others who go on having asthma throughout their adult life. If we can find the markers or different levels of inflammation it could help us differentiate between the two groups and explain why certain people behave in a different way from others in respect of chest symptoms. This is an exciting possibility – it’s completely virgin territory.”

A mini SIFT-MS machine could also be used in an attempt to help patients suffering with cystic fibrosis – the UK’s most common life-threatening, inherited disease.

Professors Lenney and Smith have already been involved in a project which set out to determine whether strains of pseudomonas aeruginosa (PA) from children and adults with CF produced distinctive volatile compounds that could be measured by SIFT-MS. This involved taking sputum samples from the patients, which were used to grow PA, which is associated with a distinctive smell produced by a combination of volatile compounds. The sample plates were incubated for 48 hours inside sealed plastic bags and the air surrounding the cultures was analysed using SIFT-MS. In the majority of samples hydrogen cyanide gas was detected.

A small machine would be easily transported and could be used alongside a patient’s bed to obtain samples for testing.

“For the first time we are looking at the possibility of having a simple machine which a patient can breathe into three or four times and we will be able to analyse the samples,” said Professor Lenney. “And we should be able to do that with patients down to the age of three or four, which would be a major advance for us.”

February

The Higher Education Funding Council is funding two major projects at the University, which follow the approval of bids under the HEFCE scheme for capital funding for learning and teaching and IT. £632,106 will be spent on projects to improve access and amenities across the campus for people with a disability. A second project costing £315,108 will create a state-of-the-art, multi-user, flexible laboratory facility for the new Forensic Science Principal Course and the projected degree in Pharmacy.

HEFCE awards 24 additional funded places to the University in order to launch the new undergraduate degree in social work. HEFCE placed social work amongst its small number of priority areas for growth and competition for these additional places was keen.

Dr Diego Garro, SOLCCA – Music Technology, is invited to the ‘VAD’ Festival Internacional De Video I Arts Digitals, in Girona, Spain, to present the world premiere of his work, ‘Pointes Precaires’, for computer generated audio-video.

Professor Susanne Karstedt, Department of Criminology, is elected to the Board of the German Research Foundation for ‘Criminology’ within the discipline of Law and Jurisprudence, on which she will serve for the next four years.
faculty of humanities and social sciences

Report of the Dean

This will be my first and last report as Dean of the new, combined Faculty of Humanities and Social Sciences, since my successor – Professor Sue Scott, who was Dean at Durham – is about to assume office. It is with some regret that I retire from the fray, since the last six months have been extremely rewarding, if sometimes rather hectic, given the wide range of different subjects encompassed by the new Faculty, from Music to Social Work. The number of disciplines in my charge has more than doubled, while the total of staff has more than trebled.

Moreover, these additional responsibilities have been accompanied by continuing progress with the KEELE2006 project. The former Faculty of Humanities now constitutes a single School of Humanities, which has emerged from the four schools – American Studies, English, History, and Languages and the Arts – which previously existed. Changes have also occurred in Social Sciences, where Professional Ethics has joined Law, while Criminology, Sociology, Social Work and Education have become a single school. Economics, Human Resource Management, Health Planning and Management and Management have also joined forces as the School of Economics and Management Studies.

The objective of this reorganisation is to deploy teaching resources more effectively in larger units, as well as to encourage cross-fertilisation between the different subjects. This is already beginning to happen, most notably with the interdisciplinary undergraduate programme in Media, Communications and Culture, which has recruited even more strongly in its second year and should attract an intake of around 100 students in 2005. A new single-honours degree programme has also been established in Accounting and Finance, which draws on expertise in Economics and Management and Law. The Humanities Foundation Year recruited beyond expectation in September 2004, and a Social Sciences Foundation Year is currently receiving course approval. These two programmes are part of the Widening Participation agenda at Keele, but they also provide an additional route into a Faculty where the overall recruitment of undergraduate students remains extremely buoyant.

The other significant feature of the 2006 agenda is the establishment of Research Institutes (RIs), separate from Schools (which will concentrate on undergraduate and postgraduate teaching). The aim here is to focus our research efforts more sharply and, once again, to encourage fruitful collaboration between scholars from different disciplines, building on the successful collaboration between History and English, for example. We are also seeking to raise our game where obtaining research grants is concerned and dedicated administrative support in the RIs will facilitate this. There will be four Institutes in the Faculty, with a fifth (Life Course Studies) straddling HSS, Natural Sciences and Health. Institutes will also facilitate more enterprise activity, not least in the area of Continuing Professional Development, which can draw deeply on the public service element embedded in much of our research culture. The relatively low numbers of ‘home’ postgraduates remains a cause of concern, though the newly introduced Masters in Finance has proved extremely popular with international students and, once again, this matter will be a priority for the emerging RIs.

Despite significant success in the 2001 Research Assessment Exercise, which we are seeking to surpass in the 2008 round, the bulk of our income in the Faculty still comes from teaching. Efforts to improve its quality continue apace. As the Student Welfare Officer reminded me recently, students increasingly think of themselves as customers and, while I cannot entirely endorse the analogy, they have certainly come to expect more from their teachers. We have an excellent training scheme for new lecturers, which is based in Education, called the Teaching and Learning in Higher Education Programme, and has just been accredited by the newly created Higher Education Academy. The latter aims to raise professional standards by encouraging ALL university teachers to engage in professional development and one of the tasks of the new schools will be to ensure that the latest developments in pedagogy and technology are adopted at Keele.

During the past year an Institutional Audit of teaching has taken place at Keele, with the result that complete confidence (the best possible outcome) has been expressed in our standards. Two schools in the Faculty, Management and History, were the subject of specific examination and both passed with flying colours. Indeed, one younger colleague in Management, Dr Jennifer Lees-Marshment, received a University Teaching Award for her innovative pedagogy. Like other colleagues in HSS, she has been experimenting with the use of information technology in her teaching and is especially well connected with national learning networks in her discipline. One striking feature of the Social Sciences at Keele, notably in Law, Criminology and Management, has been the recruitment of additional staff to cater for rising numbers of undergraduate students. It has been a real privilege to work with them, and early-career colleagues elsewhere in the faculty, as they begin to make their particular mark on the University, in terms of both teaching and research.

The School of Medicine, in association with the Royal Society of Medicine, hosts a Careers Day, “So You Want to be a Doctor?” for more than 250 schoolchildren, ages 15 and 16, who want to find out more about a career in Medicine.
International Success for Music

The Music Department at Keele has achieved an international reputation since its foundation in 1973. At the centre of the department's teaching and research is its commitment to twentieth century and contemporary music of all kinds. During the year the department has enjoyed much success.

Composition

A delegation of the Music Department was invited to the 10th edition of the International Electroacoustic Music Festival ‘Primavera en la Habana’, Cuba, to present papers on their research activity in the area of Electroacoustic Composition and Music Software development. The half-day slot of this prestigious event featured Professor Mike Vaughan and Dr Diego Garro, who presented reports on the activities of the Music Technology Group, including a demonstration of Professor Rajniti Fischman's music compositional software tools AL and ERWIN, a project funded by the AHRC and supported by PRS for Music.

The same concert was presented when Professor Fischman featured as the principal guest at the First Festival of Electronic and Electroacoustic Music and Technology in Lima. He also delivered three presentations, which included ‘In Memoriam (layer 5), a work for interactive mixed media by Vaughan, ‘And I Think to Myself …’, for computer generated audio tape by Fischman and ‘Pointes Précieuses’, an audiovisual work by Garro. ‘Pointes Précieuses’ was subsequently awarded first prize at the internationally renowned Bourges Competition of Electroacoustic Music, France.

Dr. Sohrab Uduman's In Accord, in Motion was recorded for a CD of music by contemporary British composers to be issued by the British Music Information Centre and his Contour (in a version for Eb clarinet and live electronics) has been recorded for release by Kate Romano.

Musicology

The musicologists in the department have been involved in international meetings, collaborations, journals and publications. Dr Alastair Williams published a major chapter on modernism since 1975 in The Cambridge History of Twentieth-Century Music. This state-of-the-art volume is the first appraisal of the development of music in the twentieth century from the vantage point of the twenty-first. He also published an article on the contemporary German composer Wolfgang Rihm in the Journal of the Royal Musical Association, and was invited to join the International Advisory Panel for the same journal.

Dr. Barbara Kelly was invited to chair a session at the Annual Conference of the American Musicalological Society in Seattle. She was also elected on to the Council of the Royal Musical Association and was invited to be guest editor of a special French issue of Nineteenth-Century Music Review. She participated in an international project on French Naturalism and Opera (Le Naturalisme sur la scène lyrique), the outcome of which was published by the University of St Etienne, France.

The Europeanisation of National Political Parties

The European Union's multi-level system of governance is becoming increasingly important for national politics – a development that has been documented over the past 10 years by research on the increased impact of the EU on politics and policy-making procedures of its member states.

However, no study had examined the effects of the EU on national political parties even though political parties occupy a vital position in the workings of parliamentary government in Western Europe.

A major cross-national project, run from the Keele European Parties Research Unit, hosted within the University’s School of Politics, International Relations and Philosophy, is examining the impact of European integration on national political parties and seeks to correct the lack of attention they have received as a result of the increased influence of EU supranational factors.

Through a two-stage design that combines in-depth case studies of parties in six EU member states (Austria, France, Germany, Spain, Sweden and the UK) with a comprehensive study of all relevant parties in 15 old member states, the project explores changes in the formal organisational structures of parties as well as transformations in the patterns of political processes within parties.

It has been hypothesised that the process of Europeanisation will have strengthened the power of party elites in general and Euro-specialists in particular. The three-year project is funded by the British Economic and Social Research Council, with additional support from the Keele University Investment Scheme. It is led by Professor Thomas Poguntke, with Dr Robert Ladrech, Dr Richard Luther and Nicholas Aylott at Umea/Keele. Other project members are Dr Elisabeth Carter (Keele), Dr Laura Morales (Murcia) and Dr Luis Ramiro (Murcia).

Professor Ianla Crome, Professor of Addiction Psychiatry/Academic Director of Psychiatry is elected President-Elect of the Addiction Section of the Association of European Psychiatrists.

A consortium of astronomers, including Keele, celebrates the commissioning of the SuperWASP facility at the astronomical observatory on the island of La Palma in the Canary Islands, which is designed to detect thousands of planets outside our solar system. SuperWASP is the most ambitious project of its kind in the world and its extremely wide field of view, combined with its ability to measure brightness very precisely, allows it to view large areas of the sky and accurately monitor the brightness of hundreds of thousands of stars.

Professor John Dobson, Professor of Biophysics and Biomedical Engineering, ISTM, receives a Royal Society Wolfson Research Merit Award. Jointly funded by the Wolfson Foundation and the Office of Science and Technology, the purpose of the awards is to provide universities with additional support to attract to this country, or keep here, researchers of outstanding achievement and potential.
Report of the Dean

It has been a busy and successful year in the Faculty with significant contributions from Schools to the Research and Enterprise Agendas. I commend the Schools for putting considerable effort into undergraduate recruitment, which is paying dividends.

Highlights in the School of Chemistry and Physics include the awarding of a five-year RCUK Academic Fellowship to the Astrophysics Research Group and major contributions to Keele’s enterprise agenda and support of its HEIF activities. Professor Jim Howell was awarded a major grant from DEFRA for his research on using resins from sustainable sources for the manufacture of composite materials. A number of successful consultancy projects have been undertaken by Professor Mark Ormerod and Dr Peter Haycock funded by MAS and Envirominate. Furthermore, a Medici Fellowship has been awarded to support research in Clean Technology, and several Mercia Spinner Awards have been made to Professors Howell and Ormerod, Dr Haycock and Professor Brigid Heywood to support their enterprise activities. The year also saw a major development in the School as Keele’s new Forensic Science degree commenced, with a very commendable first intake of 51, combined with a major laboratory refurbishment to establish a new multi-user analytical laboratory supported by some exciting new forensic science equipment.

It has been a particularly successful year for grant applications in the School of Computing and Mathematics in a very competitive climate. Professors David Budgen, Pearl Breerton and Barbara Kitchenham and Mr Steve Linkman were awarded £118,000 from EPSRC for their work on evidence-based software engineering, Professors Budgen and Breerton also received a British Council Alliance Programme award. Professor Victor Shriva received £165,000 from EPSRC for three years to support his work on a water wave numerical tank for modelling long-time evolution of weakly non-linear random wave fields. Professor Yibin Fu was awarded a prestigious Leverhulme Fellowship for two years to study the characterisation of edge waves on generally anisotropic elastic or piezoelectric plates.

The School of Earth Sciences & Geography saw a healthy rise of 8% in student numbers, continuing the recent rising trend. During 2004, the School welcomed three new members of staff: two more will start early in 2005, following staff retirements or departures. As a result there has already been a realignment of Physical Geography research with the formation of a new research group. Professor Peter Syles was appointed President of the Geological Society of London for two years; he will have the task of preparing for the bicentenary celebrations in 2007. The Applied and Environmental Geophysics Research Group received additional SRIF2 money, bringing the total provided for advanced geophysical equipment to £249,000. They were also awarded funding of £112,000 for microseismic and infrasound monitoring of windfarm noise in the Southern Uplands, to assess its potential interference on the capability of the UK to detect nuclear weapons tests. Other smaller research grants have funded projects in Spain, Scotland and Azerbaijan during the year.

Within Life Sciences, the Centre for Communication and Neuroscience commissioned a new SRIF funded Scanning Electron Microscope. Dr Michael Evans was appointed Reviewing Editor for the Journal of Physiology and Dr Mary Palmer took up her MRC Career Award. In the Centre for Applied Parasitology and Parasitology Professor Hilary Hurd took over as president of the British Society for Parasitology. Dr William Kirk was invited speaker at the 8th International Symposium on Thysanoptera in California and Dr Peter Thomas obtained a Bullard Fellowship at Harvard and was appointed visiting research fellow there. In the Centre for Molecular Biology and Biomedicine, the apoptosis group led by Professor Gwyn Williams obtained new funding amounting to £0.5 million from Wellcome, BBSRC, NCRI Prostate Cancer Collaborative and the Breast Cancer campaign to support their work on apoptosis in cancer. Dr Nikki Goodstone, a recent appointee, was awarded funding from the Arthritis Research Campaign and other sources to support work on cartilage repair mechanisms. Several new intercalated medicine degree programmes were established, whilst the Principal Biomedical Sciences degree programme was successfully re-accredited by its professional body.

The School of Psychology continues to enjoy a high number of undergraduate applications, and its part-time training courses in counselling retain their popularity. Professor John Sooboda was elected to a Fellowship of the British Academy for his contributions to the Psychology of Music and this year saw the publication of his book by OUP entitled “Exploring the musical mind”. Professor Elizabeth Robinson and Dr Stephen Haigh were awarded a grant from the ESRC to study children’s understanding of what they know. Dr Alexandra Lamont and Dr Mark Tarrant were supported by the Qualifications and Curriculum Authority for work on Progression in the Arts. Dr Tarrant was also successful in winning a contract for research on the effect of music on listeners’ emotions. The School of Psychology’s long involvement in applied and health research was strengthened by the appointment of Dr Maggie Robson to a senior lectureship in counselling psychology, whilst Dr John Hegarty was appointed research consultant to a project on the role of art and horticultural therapy for people suffering from chronic fatigue syndrome.

Professor Peter Jones, Dean of the Faculty of Natural Sciences
The NERC RAPID climate change thematic programme aims to improve our ability to quantify the probability and magnitude of future rapid climate change, with a main focus on the role of the thermohaline circulation within the Atlantic Ocean. Polynyas are regions of nearly ice free open water surrounded by sea ice. They have a high ocean to atmosphere heat loss and thus produce large volumes of ice. Due to this large ice production rate, polynyas are potential sites for dense water formation, which plays a significant role in driving the thermohaline circulation in the Atlantic Ocean, which in turn regulates the climate.

The physical processes within a polynya are shown in figure 1. Polynyas are also focal points of biological activity throughout their existence, providing predictable over-wintering grounds for marine animals and large supplies of planktonic microalgae, which is the base for the polar food web, in spring. In fact, the North Water Polynya, between Canada and Greenland, is the most productive Arctic ecosystem. Figure 2 shows the ubiquitous nature of polynyas in the Arctic region.

Within this programme Keele University Mathematics Department, in conjunction with the Proudman Oceanographic Laboratory, is developing models of polynyas for use within regional or global scale numerical oceanic circulation models. In a warmer climate what will happen to polynyas and to dense water production and therefore to the thermohaline circulation. To investigate this question a number of numerical models will be run in conjunction with POL.

Patrick Manson Insectaries

The Centre for Applied Entomology and Parasitology (CAEP) was delighted to see the completion of the Patrick Manson Insectaries, named after one of the founding fathers of Tropical Medicine. This new facility was formally opened by the Chancellor, Professor Sir David Weatherall, who has a long-standing research interest in tropical diseases.

This suite of seven controlled environment rooms and associated facilities was funded by an equipment grant of £140,548 to Professors Paul Eggleston and Hilary Hurd and by SRIF funding to the University. The new facility will accommodate all of CAEP’s current research on insect vectors (particularly mosquitoes and sandflies) and their interactions with the agents that cause human disease. It will also facilitate planned expansions of research activity into the transmission of human malaria. The opening of the Patrick Manson Insectaries reinforces the reputation of CAEP as one of the major centres for research into insect-borne disease.
research, knowledge transfer and enterprise

Research and enterprise at Keele continue to be a major feature of the University’s academic programme where the culture stimulates world class research outputs and continues to be a major attraction for the recruitment and retention of first class academic staff and postgraduate students. A record number of research grant applications (501) were supported in 2004, attracting £7.6M of new research funding. The enterprise agenda proved to be equally successful attracting nearly £300K of new contract income, whilst the licensing of Intellectual Property generated a further £860K for Keele.

**Major International Grant**

The Arts and Humanities Research Board awarded one of its largest grants (£533,661) to an international consortium headed by Keele. Professor Jim McLaverty is tasked with editing fourteen volumes, between 2005 and 2010, which record and analyse Jonathan Swift’s early works. The finished archive will be made available to all scholars through the Arts and Humanities Digitisation Service.

**Major UK Centre For Tissue Engineering**

The flagship facilities for cell and tissue engineering hosted at Keele, Hartshill and Oswestry will continue to service effective links between leading edge scientific developments in human tissue regeneration and patient focused research of benefit to future generations, following the award of major research funding (£1.5M) from the BBRSC, Welcome Trust and MRC.

**Keele Research Supports Local, National & International Public Policy Developments**

Keele contributes to challenging public policy debates through a diverse portfolio of social sciences research projects – The Resettling of Youth Offenders for Life After Imprisonment (ESRC CASE Award 2004); A Survey of Pupils and Teachers to Support the London Challenge Project (Department of Education and Skills); The Further Development of The Health Care Standards (Department of Health); The Impact of Employment Growth on Crime of the past 70 years (Leverhulme Trust); An Integrated Approach to the Economic Evaluation of Ecosystems (EU Framework 6); The Changing Landscape of European Liberty and Security (EU Framework 6).

**Project Chrysalis**

£2.5M of Higher Education Innovation Fund funding was awarded to Keele to support its successful enterprise strategy. This funding is dedicated to the development of an institutionally embedded Business Development Network focused towards academic units with the capacity for developing external research partnerships, producing intellectual property of commercial value and supporting knowledge transfer. A proportion of the funding (40%) will be directed towards pursuing external linkages and fostering knowledge partnerships across the West Midlands. Four Medici Fellows were recruited from a strong competitive field and the benefits of their attachment can be evidenced by an increase in number of IP disclosures (119), and the successful procurement of £160K in Spinner grants to nurture the commercialisation of research.

“Working with Keele enabled Advance Enterprises to widen its field of activities introducing new patented technologies under licence to a number of significantly sized industries globally...”

Jay Taylor, Managing Director, Advance Enterprises Ltd., a Lord Stafford Award Winner

**Two Shortlisted at The Lord Stafford Awards**

The Lord Stafford Awards are designed to stimulate innovative collaboration between ‘West Midlands’ businesses and the 15 ‘local’ universities.

This year Keele had two shortlisted projects and both received judge’s special commendations. One, nominated for Development in Innovation was the innovative collaboration between West Midlands’ businesses and the 15 ‘local’ universities.

**Keele University Individual Award for Learning and Teaching Excellence**

Two special awards were also presented: the Keele University Individual Award for Learning and Teaching Excellence and the Keele University Award for Departmental Learning and Teaching Excellence.
They will receive business development training and mentoring to support their embryonic business ideas, which include a diagnostic medical screening device, a hybrid supercharger for the performance automotive industry, equipment to facilitate non-destructive testing for the construction industry, a novel method of drug distribution and e-learning software.

Researchers for the 21st century
A prestigious five year EPSRC Academic Fellowship in Astrophysics was awarded to Chemistry & Physics. Primary Care Sciences secured a three year ARC Fellowship to improve the effectiveness of primary care for non-specific back pain. Keele also welcomed a new MRC Fellow, Dr Mary Palmer, who will develop her research on the regulation of neurotransmission in the retina over the next five years.

In 2004 Keele recruited seven Enterprise Fellows (funded by the European Regional Development Fund and the Science & Enterprise Council) who aim to create high growth businesses in the local economy.

Building State-of-the-Art Research Facilities
Since 1998, Keele has received over £7M from the Science Research Infrastructure Fund to secure the development of major physical infrastructure projects for research. In 2004, funding for a new research centre dedicated to Humanities and Social Sciences, The Moser Centre, was approved alongside support for the development of a new £3M patient-oriented research facility in collaboration with the NHS. Other funded SRIF projects addressed rural regeneration, clean and sustainable technologies, the non-destructive analysis of ground based phenomena and the search for extra-solar planets.

Keele Undergraduate wins regional Enterprise competition
Heather Phillips, a first-year undergraduate won £1,000 in the local heat of the Mercia Institute for Enterprise Business Ideas Competition (BIZCOM). She followed this local success with a win in the West Midlands regional competition and her company, “Smiley Faces”, received £4,000, then went on to win a Lord Stafford Award for the best student business plan and received a trophy and one year’s membership of the Institute of Directors.
international links

Keele was awarded the prestigious Socrates European Quality Label for the organisation of mobility activities in the Erasmus programme. The evaluators said: “The University’s mobility activities are in balance—a significant achievement for a UK institution. This is the consequence of a number of factors: the fact that collaborative links and attendant procedures are managed with tight focus, evident commitment and an imaginative use of IT; an institutional strategy which provides appropriate support to programme administrators and which guarantees the access of non-mobile students to the European dimension; the high internal profile enjoyed by the ERASMUS co-ordination, resulting to a large extent from their excellent communications and particularly user-friendly documentation.”

Japan

Two students learning Japanese as part of the Complementary Studies Programme, Ben Falck, English and American Literatures, and Stan Utting, from the Continuing and Professional Education programme, spent a month in Shinshiro, one of Newcastle-under-Lyme’s namesake twin towns. It was the first time students from Keele have been involved in a community link at international level and it is an aspect of our internationalisation strategy we are keen to develop.

Whilst in Shinshiro they gave a presentation to an audience of 60 people on Newcastle and Keele University and also visited two schools, helping pupils with their English.

Leonardo

Keele’s involvement in European work placements under the ELJ’s Leonardo Programme has grown steadily and there are now opportunities for undergraduates and recent graduates to work in laboratories in France, Germany, Denmark, The Netherlands and Poland.

Kay McNamie, who spent a year in the Animal Sciences Group, Department of Cell Biology and Immunology at Wageningen, The Netherlands, said: “This year has been extremely beneficial for me. My scientific knowledge has broadened greatly, largely due to practical applications of my theoretical knowledge. I have been reading new developments in science all the time to try to expand my own ideas and research. My biggest worry was not being able to learn all the techniques I’d read about, but I found that this was not a problem at all, and I am eager to continue this practical experience.”

Nursing

Wynne Thomas, Lecturer in Nursing, made an exploratory visit to Australia, meeting with colleagues both at Deakin University, Melbourne, one of Keele’s current partners, as well as the Australian Catholic University and the University of Queensland in Brisbane. At Deakin they discussed the idea of a small group of final-year nursing students from Keele going to Deakin to undertake a “reflective” clinical placement for several weeks during which time they would observe nursing practice in different environments and interview staff and students. Nursing students have so far not been able to integrate a period of “study” abroad and this is a first step to addressing this situation.

Royal Doulton Scholarship

This scholarship benefits the best students of each year group who apply to study abroad. Jenna Catley, Law & Politics, who spent a semester at the University of British Columbia, said:

“The most important thing about the scholarship money was that without it I would have struggled to buy the basic things I needed. I cannot rely on my parents for money when I run out because of their financial situation. It enabled me to finance the entire study period independently.”

Next year there will be two further scholarships from the British Universities Transatlantic Exchange Association to an incoming and an outgoing student.

Keel launches a DVD, called ‘In the Picture’, about higher education and aimed specifically at parents in Stoke and Staffordshire. The DVD is the first of its kind in the UK, and if successful locally it is hoped that it can be adapted for use on a national basis. Funded by AimHigher it aims to give parents a better understanding of higher education. It took twelve months to make and Keele hopes to distribute 6000 free copies to households across the local area.

Professor Stephen Chapman, Department of Medicines Management, delivers the opening plenary lecture at the National Medicines Symposium 2004 in Brisbane. The Department of Health establishes The Health Care Standards Unit under the Directorship of Professor Ellie Scrivens, to assist with the maintenance and development of the Secretary of State’s statement of standards for better health with core funding of £780,000 a year for a period of four years.
Mitchell High School, Stoke-on-Trent, won the event and were invited for an interactive workshop with the aerial archives where they selected photographs to take back to their school, followed by lunch with Dr Philip Morgan, History, and Dr Sarah Hatfield, WP. They were awarded certificates and £100 worth of book tokens at a presentation.

New departments such as Forensic Science and Operating Department Practice have also offered Widening Participation activities for the first time this year.

Keele continued to offer its core activities including the largest Six Towns Residential ever, attended by over 500 students, and the largest HE Summer School in the West Midlands Region. Additional residential programmes were run for Liverpool AimHigher, Newcastle schools and Stoke-on-Trent Sixth Form College.

Kate Fox, new media co-ordinator, has developed two new media projects which have been launched this year. WP recognises the need to influence ‘gatekeepers’ (teachers, carers and parents who influence school students’ educational choices on a daily basis), and have produced a parents’ DVD, ‘In the picture’, for home use, and a classroom-based resource for GCSE students and supporting teachers’ pack, ‘Futureproof’.

Both resources have been well received, the latter receiving seven awards to date, including The British Interactive Media Awards ‘Grand Prix Award for best interactive new media product 2004’. Both products are HEIST finalists for 2004.

The Widening Participation team welcome more than 500 students and their teachers, from fifteen Stoke-on-Trent High Schools, for the annual Six Towns project. The three-day event focuses on Further Education and Higher Education progression from GCSE.

The British Association for Victorian Studies hosts its 5th annual international conference at Keele. Professor Maggie Pearson, Deputy Vice-Chancellor, welcomes 115 delegates from Britain, continental Europe, the United States, Australia, and Taiwan.

Professor Miriam David is appointed as Associate Director of the ESRC’s Teaching and Learning Research Programme with responsibility for all research about teaching and learning in higher education and lifelong learning.

Dr Graeme Jones, School of Chemistry and Physics, gives his Lord Kelvin Award Lecture ‘Saturday Night Science’, to a packed audience at the British Association Festival of Science in Exeter. Professor Hugh Tomens, Emeritus Professor, School of Earth Sciences and Geography, gives two lectures at the festival – the UK’s largest science festival: “Mary Anning’s Fossil-Collecting Career” and “Thoughts on the Early History of Geology in the Wild West”. 
3D photographs of Nazi-occupied western Europe, used by Steven Spielberg when he was researching “Band of Brothers”, are being made available to everyone online for the first time. Over five million World War II aerial photographs – from The National Archives, in Kew, West London – will be available at www.evidenceincamera.co.uk

The new website, developed by The Aerial Reconnaissance Archives (TARA) at Keele, allows people to search for images, from photographs taken by Allied pilots, of the D-Day landings, Auschwitz and other key events and places during the war.

Head of Digitisation at TARA, Allan Williams, said:

“These images allow us to see the real war first hand – as if we were RAF pilots. I was really moved by the photographs of the Nazi concentration camps and the D-Day landings. It is astounding to see the pictures of Cologne before and after the bombings. It’s like a live action replay.”

Sarah Tyacke, Chief Executive of The National Archives, which owns the photographs, said:

“Before the archive went online, you would have to visit Keele and manually search through thousands of boxes to find the photograph you wanted. Now anyone can access the archive and see images which had until recently only been seen by wartime intelligence officers. This is another great step forward in the online revolution happening in archives.”

Like the code-breakers at Bletchley Park, the photographic interpreters played a key role in World War II. No attack, whether a bombing raid, the landing of a few men on a beach or a massive landing of an army, was possible without their preparation of material. The photographic techniques used enabled the interpreters to view the enemy’s activities in 3D, and to prepare highly detailed intelligence reports.

Allan Williams said:

“After the war, the same material that was used in anger was supplied to specialist bomb-disposal agencies throughout Europe. Thousands of unexploded bombs throughout Europe have been safely detonated thanks to TARA imagery, with countless lives saved. With more than ten million high-explosive bombs dropped during World War II, even today TARA continues this work on a daily basis.”

Leading British poet, Carol Ann Duffy, gives a public reading of her poetry to a capacity audience in the Westminster Theatre. This very successful event is attended by students, staff, school students and many members of the public.

The Rt Hon Baroness Hale of Richmond gives a public lecture in the Westminster Theatre to mark the launch of a new AHRB Research Centre for Law, Gender and Sexuality, the first research centre in the UK to focus on these areas and the result of a partnership between Keele, Kent and Westminster Universities. The event launches the University’s Public Sector Series of Lectures.

Dr Graeme Jones, School of Chemistry and Physics, is shortlisted for the European Union Descartes Prize for Outstanding Science Communication Actions. Dr Jones was nominated by Keele University and the British Council in recognition of his work building models of DNA with the general public both at home and as part of the international DNA50 tour during 2003/04.
The MED ICA building on the Science and Business Park, which offers high specification accommodation for medical technology companies, opens. It is one of two new high-specification medical technology innovation centres – part funded by Advantage West Midlands – which will create a total of 56,000 square feet of laboratory, office and incubator units, with access to shared specialist laboratory equipment, for medical technology companies.

“The archival team have been scanning and cataloguing the maps and references used to search the archive, ready for the website’s launch. We have manually keyed in 800,000 map references, relating to 33,000 reconnaissance flights – 5,000 more than we thought we had when we started.

“Now that we have released the five million pictures of occupied western Europe, we will start cataloguing over 2.5 million photographs of Eastern Europe taken by the Luftwaffe and we are already working on the millions of other aerial reconnaissance photographs at TARA, from World War II and later conflicts.

“There are already more than 10 million images held at TARA, and within five years the website will have access to more than 40 million reconnaissance images, taken throughout the world since 1938. Ultimately, aerial reconnaissance photographs of all British military campaigns, including the Suez crisis and the Korean War, the Falklands conflict and Gulf Wars will be available to the public.”

Notes on selected photographs:

AUSCHWITZ: This unique photograph, recently discovered at TARA, shows clouds of thick smoke coming from the Auschwitz camp. At this stage in the history of Auschwitz, in the final months of the war, we now know the number of people being killed was so high that the crematoria were unable to burn all the corpses. This image graphically illustrates the burning of these mass funeral pits. When viewed at high-resolution, prisoners can even be seen on roll-call.

EARLY RECONNAISSANCE PLANES: This photograph shows a Fairey Battle aeroplane of 266 Squadron, Advanced Air Striking Force, at the very beginning of the war. Taken from another reconnaissance aeroplane, the pilot in his flying helmet, can be clearly seen. The primitive beginnings of aerial reconnaissance in World War II are clear.

Professor Paul Strange, School of Chemistry and Physics, is awarded the title of Honorary Scientist at Daresbury Laboratory. The award recognises high standing in the scientific community and is given to a limited number of distinguished scientists in recognition of work that has a strong overlap with the research of the laboratory.

A report in the Daily Telegraph on HESA’s recently released Performance Indicators for Higher Education places Keele in “an Ivy League” of 12 universities which had a graduation rate of 90 per cent or more.

HESA’s report also showed that Keele had one of the country’s lowest drop-out rates at just 4.2 per cent, against an 11.3 per cent benchmark, and that Keele attracted 91.2 per cent of its students from state schools (benchmark 87.1 per cent).

HEFCE announce that Professor Maggie Pearson, Deputy Vice-Chancellor, has been appointed to chair a Main Panel for RAE 2008. The principal areas covered by Professor Pearson’s panel are Dentistry, Nursing & Midwifery, Allied Health Professions & Studies and Pharmacy.
teaching excellence

The Learning and Teaching Committee announced that the Keele Departmental Award for Learning and Teaching Excellence was to be presented to the School of English.

The award is for a department which demonstrates excellence in any activity, which is beyond the scope of an individual teacher. The School of English demonstrated excellence in the support of student learning. The award recognises the School’s outstanding ability to influence students positively and to enable students to achieve specific learning outcomes.

In the wider context the School demonstrated its ability to influence and inspire colleagues in the University and the wider community of teachers and learners. They achieved this by example and through dissemination of good practice in relation to the development of academic writing. The award was received by Dr Susan Bruce, on behalf of the School, during the summer’s degree ceremonies.

The winners of the University’s Individual Awards for Excellence in Learning and Teaching in 2003-4 are Dr Jennifer Lees-Marshment, Department of Management, (in the category of Rising Star for those with less than six years experience in teaching or supporting learning in HE) and Dr Stephen Bostock, Staff Development (in the category of Learning Support).

Professor Maggie Pearson

The University was delighted to announce the appointment of Professor Maggie Pearson as the new Deputy Vice-Chancellor. Professor Pearson was a senior civil servant in the Department of Health, where she was Deputy Director of Human Resources with lead responsibility for policy on learning and personal development across the entire 1.3 million NHS workforce.

Prior to that, Professor Pearson was the Regional Director of Research and Development for the North West Region of the NHS, from where she strongly supported Keele’s medical school bid. This followed an academic career, principally at the University of Liverpool, ultimately as Professor of Health and Community Care, and Director of the Health and Community Care Research Unit.

During her time at the Department of Health, Professor Pearson was visiting Professor of Health and Community Care at the University of York. With a first degree and PhD in Geography and a professional qualification as a State Registered Nurse, Professor Pearson brings a wide range of skills to her new appointment at Keele.

With earlier connections to Keele through her work in research in gerontology and the University’s successful medical school bid, and strong family roots in North Staffordshire, Professor Pearson is delighted to be joining the senior management team at an exciting time of development and change at Keele and within the Higher Education Sector generally.

Professor Sue Scott

Professor Sue Scott has been appointed Dean of the Faculty of Humanities and Social Sciences. She has significant experience of University management at both Head of School level and as a member of the senior management team at the University of Durham.

Professor Scott was Postgraduate Dean and Principal of Ustinov College (Graduate Society) at Durham 2002-05, having been appointed as Professor of Sociology in 1999 and serving as Head of the Department of Sociology and Social Policy from 2000-02.

She is a distinguished Sociologist, whose recent work has been in the fields of gender, sexuality, risk and childhood, with applied work in the field of sex education. She has published widely in these areas and held awards from ESRC, MRC, The Leverhulme Trust and the Department of Health.

She is currently writing a book, with Stevi Jackson, University of York, entitled “Theorising Sexuality”.

Having worked previously at the Universities of Lancaster, Cambridge, Manchester and Stirling, Professor Scott has broad knowledge of the UK University system, a strong track record in research grants and publications, and a public profile at senior academic level within the sector. Professor Scott has also worked with Nottinghamshire Social Services Department and the Health Education Council. She is currently a member of the ESRC Research Grants Board and has fulfilled a number of other national advisory roles.

key appointments

Professor Maggie Pearson

Professor Sue Scott

Heather Phillips, Sociology & Criminology, wins the Best Student Business Plan prize at the Lord Stafford Awards. Two companies, working with Keele scientists, receive commendations in the prestigious Achievement in Innovation: Surgicraft Ltd, Redditch, working with Dr Ying Yang, Institute of Science and Technology in Medicine, and Talbott’s Heating Ltd, Stafford, in collaboration with Dr Peter Haycock, Chemistry and Physics.

Sir Richard Mottram, Permanent Secretary for the Department for Work and Pensions, gives the second lecture in Keele’s Public Sector Lecture Series for 2004/05. The lecture, titled “Public Service Reform: the view from Whitehall”, considers how recent governments have seen their role in Public Service reform and looked at how ideas had evolved, how the vision had changed and what this implied for the future.
honorary degrees
awarded in 2004

Rita Donaghy, OBE, Chair of the Advisory, Conciliation and Arbitration Service’s Council, (Doctor of the University) in recognition of her outstanding contribution to Industrial Relations in Britain.

David Edmonds, CBE, Chair of the NHS Direct Special Health Authority, a Keele graduate and former Council Member and Honorary Treasurer of the University, (Doctor of Letters) in recognition of his outstanding contribution to public service in Britain and to Keele University over many years.

Professor Roger Green, an eminent renal physiologist and Academic Head of Cancer Studies at the Christie Hospital in Manchester, (Doctor of Science) in recognition of his outstanding contribution to medicine in Britain, particularly in the fields of medical education and his involvement with the establishment of the medical school at Keele.

Baroness Greengross, OBE, Chief Executive of the International Longevity Centre UK, (Doctor of Letters) in recognition of her contribution to gerontology research and policy.

Jane Manning, OBE, internationally renowned soprano, (Doctor of Music) in recognition of her outstanding contribution to music in Britain and particularly during her role as Honorary Professor of Music at Keele.

Traudi Plesch, OBE, (Master of the University) in recognition of her outstanding contribution to the community in North Staffordshire, particularly her work with charities.

General Sir David Ramsbotham, GCB, CBE, former HM Chief Inspector of Prisons for England and Wales, (Doctor of Laws) in recognition of his outstanding contribution to public service in Britain, particularly in the field of Penal Reform.

Jane Manning Traudi Plesch Sir David Ramsbotham

Rita Donaghy David Edmonds Professor Roger Green Baroness Greengross

EnterpriseFest 2004, sponsored by the Mercia Institute of Enterprise, attracts more than 300 delegates for a day-long event in the Chancellor’s Building, which includes presentations by successful entrepreneurs, free expert advice from professionals, innovative and interactive workshops, exhibitions of business support agencies and information packs.

Keele’s newly established arboretum is launched with publication of a guide to the trees on the campus. It provides visitors with two self-guided walks and details of important trees that can be seen. To mark the event, the Vice-Chancellor plants a Monkey Puzzle tree near the library.
Keele University is awarded the Socrates European Quality Label at a ceremony held at Universities UK. The evaluators commented: “The institution has strengths in its mobility activities across most of the areas under evaluation” and “the University’s mobility activities are in balance – a significant achievement for a UK institution.”

The University Leisure Centre receives the generous donation of fitness equipment, worth more than £20,000, from His Highness Sheik Mohammed, a student at Keele.

A new study shows that the top female salaries for newly-qualified graduates in the UK are from Keele. The research, carried out by insurance firm Endsleigh, also shows that Keele’s male graduates are topped only by London University’s School of African and Oriental Studies.

Futureproof, an interactive CD-ROM for Key Stage 4 school pupils produced by the Widening Participation Unit, wins the prestigious national design award British Interactive Media Association (BIMA) Grand Prix Award for the best new media product of 2004. The project also won in the best CD-ROM category.
Residential Operations

The rolling programme of refurbishment of student accommodation on campus continued with the upgrading of a further 360 rooms. The bulk of these were in Lindsay Hall, which is now almost complete. In September, the focus moved to Barnes Hall. In addition, working closely with KUSU and Student Support, several safety initiatives were put in place, including the planning and funding for the final removal of all the old, much abused, XY47 keys. Campus accommodation remains popular and Student Accommodation Services worked hard to accommodate the increased number of Freshers keen to study at Keele, including the vast majority of students who come through the ‘clearing’ process. Training and Development falls within the remit of Residential Operations and success was celebrated in May with a bumper crop of awards for KFM staff ranging from NVQs to Leadership and Management.

Business Systems

Keele Facilities Management continue to develop the uses of the Keele Card on Campus with the Access control systems which are currently operational throughout the Science Park, some Academic Buildings and also a couple of Residential Buildings. The next stage is to roll this out further with the replacement of conventional locks in Accommodation blocks, including Barnes, Hawthorns, Lindsay and Oaks, during 2005. The card has also been developed to support the cashless payment for photocopying and printing in the Library, currently being introduced by Information Services.