



# Report and Accounts 2005

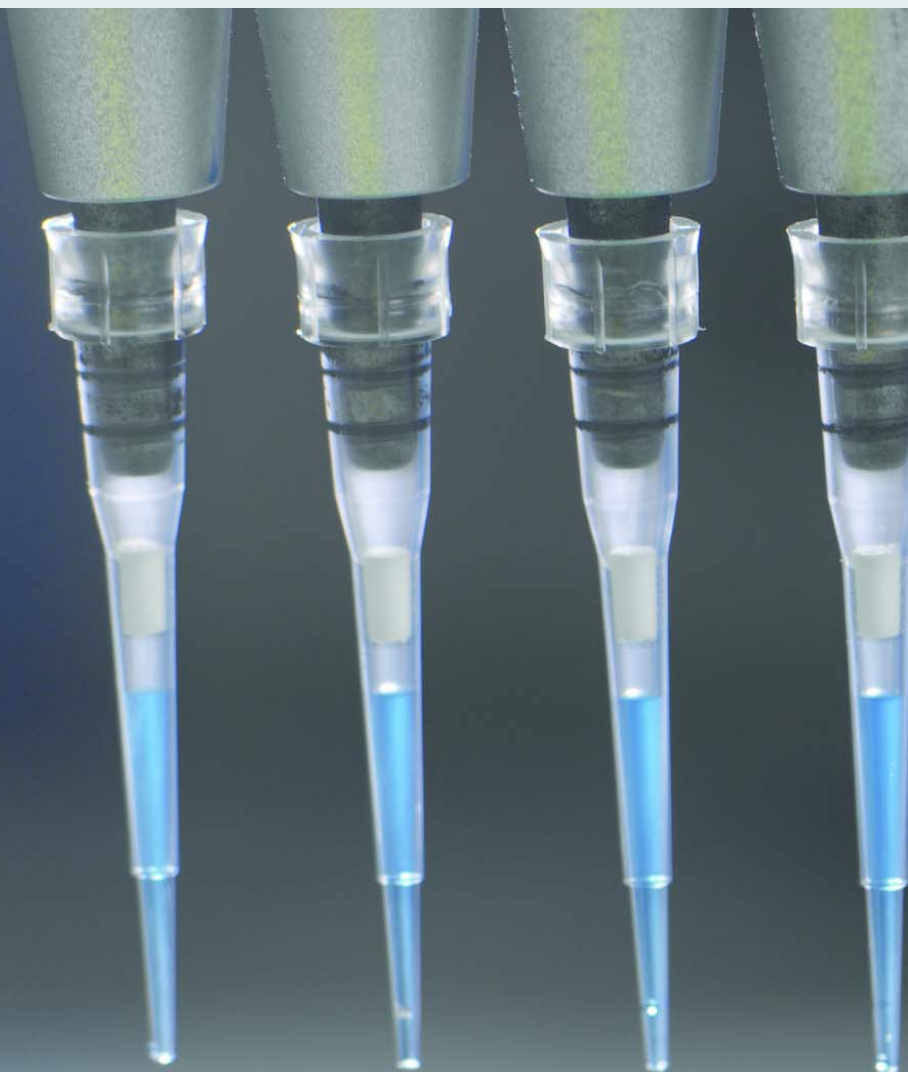
## A year of growth



*Setting standards  
in analytical science*

# Our vision

To be an international business, recognised for setting standards in analytical science and providing best value products, services and solutions



## Contents

### Our vision

Chairman's statement	1	Reference materials	16
Chief Executive's statement	2	The Board of LGC Group Holdings plc	20
Technology and innovation	4	Accounts	21
Analytical and diagnostic services	10		

# Chairman's statement

LGC's new capital structure enables the Group to extend its activities in the UK and Europe. LGC is now poised for further major investment which will strengthen the Group's position as the leading provider of analytical and diagnostic services and reference standards.



In April 2004, Legal and General Ventures (LGV) replaced 3i as our private equity investor by acquiring a majority of shares in our new holding company, LGC Group Holdings plc. With our new structure in place, the Group has developed strategic plans which envisage further major growth in Europe and India.

The annual accounts show the results of the new holding company following its acquisition of LGC (Holdings) Limited and do not, as a result, show annual comparisons. However, the Group's strong performance during 2004-05, with substantial growth in sales, operating profit and EBITDA, has enabled a preferential restructuring of debt which paves the way for further investments in the coming year.

The changes in the Group have been accompanied by some further changes to our Board. Having seen the company through major development over the last six years, Dr John Beacham stood down as a non-executive director. I should like to thank him for his contribution both as a director and as chairman of the LGC Staff Pension Scheme Trustees.

LGC has been calling on Uwe de Buhr's entrepreneurial business skills for several years, so we were pleased when he joined the LGC Board in December 2004 as a non-executive director to advise particularly on our expansion in Germany and other European countries. We were also delighted to welcome Lord Stevens of Kirkwhelpington, formerly the Metropolitan Police Commissioner, to our Board in March 2005. We will be looking to him for advice on the further growth of our highly successful forensic science business.

Geoff Battersby joined the Board as Group Finance Director in November 2004, thus strengthening the Executive Team. Finally, Richard Worswick, who formed the company on the privatisation of LGC in 1996 and has been responsible for its successful development, has stepped down as Chief Executive. Richard's contribution to LGC has been immense and I am delighted that he remains with the Group in a strategic role as Deputy Chairman. He has been succeeded as Chief Executive by Nigel Law, formerly Group Operations Director.

The success of the Group is due to the efforts of all our staff. I was pleased that around 400 staff members who were share or share option holders received returns when LGV purchased a majority stake in the Group and that all qualifying staff will receive a bonus related to our performance last year. I should like to thank everyone within the Group for their professionalism, dedication and enthusiasm.

A handwritten signature in black ink, appearing to read 'Ian Kent'. The signature is written in a cursive style with a long horizontal line underneath.

**Ian Kent**  
Chairman  
LGC Group Holdings plc

# Chief Executive's statement



The financial year has been characterised by strong growth in which sales have advanced by more than 14% to £64m. We have also made substantial investments for the future international development of the Group.

Investments made in the previous year in new laboratories at Teddington, Luckenwalde, Runcorn and Edinburgh have begun to bring returns in 2004-05. In the year under review, all areas of our business have grown organically and contributed to a record annual turnover of £64m and the resumption of strong operating profit growth.

Capital investment is essential if LGC is to remain at the forefront of analytical and diagnostic science. In the coming year, new ventures and laboratories such as our forensic expansion in Runcorn will come on-stream, thereby increasing our capacity, the scope of our services and our ability to capitalise on favourable market opportunities. Internationally, our intention to build our chemical synthesis capability is receiving added impetus through the planned construction of a new laboratory in India.

In an organisation that is expanding rapidly, with investment focused on growth, we have nevertheless launched a Group-wide initiative to drive operational efficiency, quality and capacity gains across the business. Opportunities for automation are being evaluated as part of this process. LGC is also one of a number of laboratories using InsightFaraday's new laboratory audit software, LabSmart, to help optimise our laboratory processes.

LGC's role as a National Measurement Institute for chemical and biochemical analysis has been enhanced by the new DTI programme, Measurement for Emerging Technologies. We are leading projects under the Medical Technologies theme

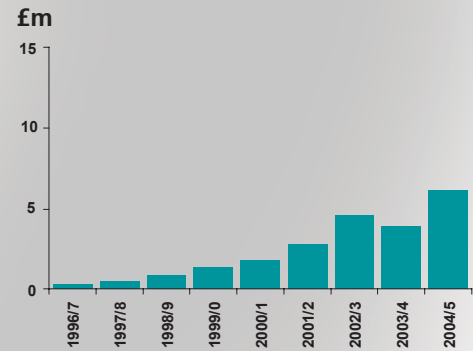
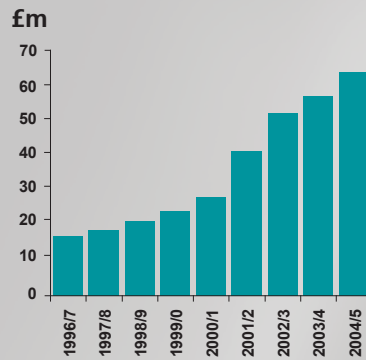
addressing some of the key measurement issues related to regenerative medicine, point-of-care testing and bioprocessing including metabolic engineering.

Our lead in other programmes under the DTI's National Measurement System, namely the Valid Analytical Measurement and Measurements for Biotechnology programmes, continues to strengthen and achieve much in securing the UK's eminent international reputation in the establishment of common measurement standards, which in turn benefit the stimulation of international free trade. In addition, we received DTI approval for a new three-year programme supporting the Government Chemist function.

## Other highlights of the past year include:

- Targeted investment in the development of selective DNA-based technologies, which has led to significant improvements in LGC's HyBeacons® system for portable and rapid DNA testing. In December 2004 we were pleased to announce a licensing agreement with Osmetech plc to access the medical genetics testing market in the USA.
- The addition to our intellectual property portfolio of a mass spectrometric method for the screening of genetic profiles for predisposition to colon cancer. It is able to provide results in a fraction of the time of traditional methods and, following successful trials, samples are now being processed for colorectal screening. Other applications for this technology platform are under development.

The graphical representations of turnover and operating profit present the annual results of the businesses acquired by the Group as if they had been owned throughout the year. Previous years' results are those for LGC (Holdings) Limited. They have not been subject to audit.



### Turnover

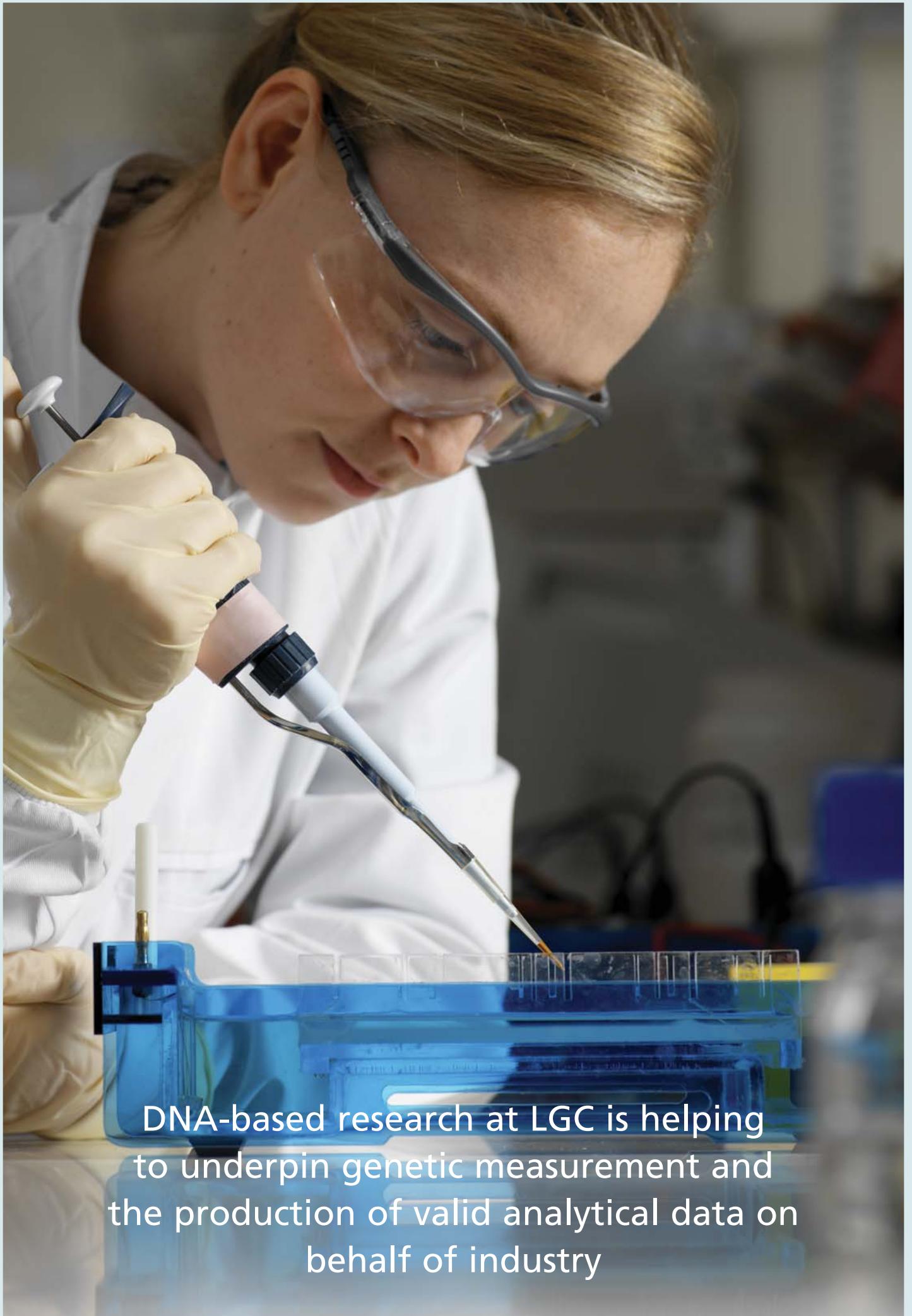
### Operating profit

- Detailed scrutiny of our forensic operations to deliver the rapid turn round times and results for existing police customers and to secure contract wins from others. Scene of crime DNA services, bulk drugs analysis and digital crime forensic work are soon to be complemented by new services from Runcorn in blood pattern analysis, fire debris and fire investigation, paint, glass, fibres, building materials and footwear marks.
- Continued investment in our BSE testing laboratories in Teddington, Runcorn and Edinburgh. These investments have been made in anticipation of changes in legislation to the Over Thirty Month scheme, and further efforts to build on our expertise by improving the efficiency of operations, exploring new testing technologies and investing in the reliability and resilience of our infrastructure to ensure service levels of the highest order.
- LGC's reference materials business continuing its impressive year-on-year growth record with plans in hand to increase the added value services available to our 10,000 strong customer base for these products. Significant highlights during the year include new distribution agreements with ATCC and ULTRA Scientific, and the extension of our operations to include Finland and Hungary. An evaluation of the market potential of the United States will also lead to the selective introduction of key lines to that market, notably the organic impurity standards relevant to both the ethical and generic pharmaceutical companies.

Overall, this has been a very successful year and I am grateful to our staff in all areas of the business. They have worked with dedication and commitment to produce this performance. In particular, my thanks are extended to my predecessor, Richard Worswick, who became Deputy Chairman in April 2005. His continuing involvement in the development of the business and his advice and support are invaluable.

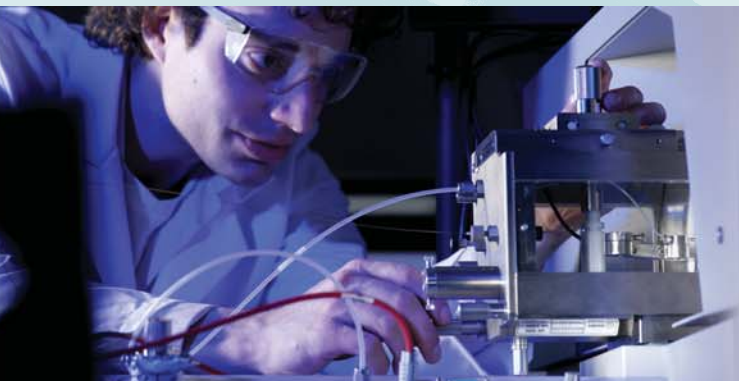
Looking to the future, it is particularly satisfying to observe the foresight shown in all areas of our business to create a strong and stable platform for sustainable growth. I look forward to working with all at LGC to maintain the momentum.

**Dr Nigel Law**  
Chief Executive



DNA-based research at LGC is helping to underpin genetic measurement and the production of valid analytical data on behalf of industry

# Technology and innovation



*Gideon Oudgenoeg uses one of LGC's new mass spectrometers - the ABI QStar.*



*Romina Barbagallo working on an MfB-funded project aiming to develop certified bio-reference materials for microarray applications.*

**Technology and innovation in analytical science is valued by LGC as being a beneficial activity for society, pushing the boundaries of what can be analysed and detected and at what level, speed and location.**

## New DTI R&D programmes

During the year, LGC contributed to the identification of core measurement issues affecting emerging technologies, such as regenerative medicine and bioprocessing, in support of DTI's forthcoming Measurement for Emerging Technologies (MET) programme. The MET programme is multidisciplinary and is intended to focus on those emerging technologies that will impact directly on industry within the next five to ten years. It will use the enhanced measurement capability developed within the National Measurement Institutes (NMIs): the National Physical Laboratory, LGC and TUV NEL Ltd. LGC, as the NMI for chemical and biochemical analysis, is now planning the detailed content of those MET projects that we will lead in the Medical Technologies theme, expanding our technology and metrology base in these important industrial sectors.

Outside the UK's National Measurement System, we have won a joint bid with TUV NEL Ltd to manage the DTI Technology Programme, an output of the government's ten-year Science and Innovation Investment Framework published in 2004. The programme focuses on priorities identified in the Technology Strategy and is being delivered using two DTI

business support products: Collaborative Research and Development; and Knowledge Transfer Networks.

## Measurements for Biotechnology

In February, a DNA microarray dataset generated by an LGC-led consortium during the 2001-04 phase of DTI's Measurements for Biotechnology (MfB) programme was made freely available online to the science community at ArrayExpress, a leading public repository managed by the European Bioinformatics Institute (EBI).

Our work with EBI continues under the cell-based testing theme of the current 2004-07 MfB programme, maximising the performance of microarray-based measurements in toxicogenomics. We are also working with the National Institute of Biological Standards and Control (NIBSC) on better prediction of gastro-intestinal drug permeability using Caco-2 epithelial cells. Members of other consortia led by LGC in this theme include the UK Human Tissue Bank, Abcellute and King's College London. Together they aim to investigate novel cell-based applications - techniques for use of human hepatocytes and models of the blood-brain barrier. More effective cell-based testing in drug development should lead to an accelerated reduction in animal testing and more effective drug screening in industry.

Indeed LGC is collaborating with the biopharmaceutical industry across all four themes of the MfB technical programme: cell-based testing, gene measurement, product characterisation and protein measurement, to increase confidence in *in vitro*-based tests and comparability of results.

# Technology and innovation



*LGC's work under the VAM programme has led to a better understanding of nutritional supplements containing selenium.*

*Paula Vickers uses one of LGC's new mass spectrometers - the ABI QTRAP.*

## Valid Analytical Measurement

Selenium is a key trace element, known to offer potential healthcare benefits such as cancer prevention. Under DTI's Valid Analytical Measurement (VAM) programme, we have been developing methods to explore issues as varied as a better understanding of which forms of selenium work best in which supplements, through to comparability between selenium measurements from different manufacturers and countries, as well as helping manufacturers to improve their quality control. The first report on the characterisation of a key selenium species - gamma-glutamyl-Se-methyl-selenocysteine - in yeast supplements, based on work by Dr Heidi Goenaga-Infante, has been published by the Journal of Analytical Atomic Spectroscopy (JAAS) - J Anal At Spectrom, 2004, 19(12), 1529-1538. This species is important as it is believed that it is metabolised into methyl selenol, which is thought to be a potent anticarcinogen.

LGC has been supporting UK industry through the VAM programme since 1988, for example, through the early development of new certified reference materials (CRMs). Collaboration with other European producers of CRMs on a diesel reference material with an especially low sulfur content to enable industry compliance with stringent environmental legislation is nearing completion under the ERM® brand. Some of the analytical techniques underpinning the sulfur measurements have also been published by Dr Ruth Hearn in JAAS and listed as a 'Hot Article'.

In response to demand from soil testing laboratories participating in the Environment Agency's MCERTS scheme,

preparation for another new CRM is under way that will contain extractable metals in contaminated land. Quality control reference materials for soils were produced during the year, also with VAM funding.

## Technological innovation

Investment during the year in mass spectrometry, one of LGC's core technologies, included an ABI QStar, an LC/Q-ToF instrument to deliver the complex protein analyses required under the current MfB programme, and an ABI QTrap, deployed so far in novel applications, for example in the analysis of chilli powder for the Sudan 1 chemical dye in samples submitted for analysis under the Government Chemist programme. It can also perform measurements useful for metabolite investigation.

Other investments across the company include tandem LC-MS purchases for LGC's toxicology teams in both Teddington and Runcorn to develop their analytical services, particularly in the detection of new drugs and toxins. Our crime scene DNA teams in Teddington and Runcorn, and our criminal justice DNA laboratory in Runcorn, have all introduced the ABI 3100 / GenemapperID for electrophoresis and genotyping. We have received accreditation from UKAS and the Custodian of the National DNA Database® to use this technology in our forensic services.

## Medical genetics

During the year we have continued to research and develop our rapid DNA diagnostics technology, HyBeacons®. The insight gained has led to new levels of mechanistic



*Gavin Nixon scanning the barcode on a plate to ensure accurate data tracking in the subsequent DNA analysis stage.*

*From left: Dr Richard Worswick with the BBC's Natasha Kaplinski, presenting the CIA Innovation of the Year award sponsored by InsightFaraday to Avecia's Dr David Pears.*

understanding and detection sensitivity (up to 50-fold) which has resulted in a new patent submission. The research has also established the capabilities of the technology to work directly with clinical samples as well as its suitability for application in high throughput laboratory-based analysis.

### Government Chemist activities

Samples received by LGC under the provisions of the Government Chemist's statutory function as referee analyst increased by 79% in 2004. In line with previous years, the majority of the 34 cases were submitted under food and agricultural legislation, disputing the safety, authenticity and/or labelling of the product. One of the issues investigated concerned the numbers of viable bacteria in probiotic food supplements. The quantities declared on labels were not always present and, as this was found to be the case, the products were removed from the market to be reformulated.

We continued to play an advisory role in regulation on behalf of industry, with 124 organisations having joined the IT-based Regulatory Advisory Service for SMEs by the end of 2004. Government Chemist support was also given to publish the Biotechnology Regulatory Bulletin and continue to provide the interactive Biotechnology Regulatory e-Service, which currently has 86 subscribers.

A new three-year Government Chemist programme to deliver and support our statutory work as the referee analyst has been agreed with DTI. It was formulated with input from those national stakeholders having a vested interest in analysis, and who also took key decisions about the programme's priorities.

### InsightFaraday

This year, InsightFaraday (coordinated by LGC from our Runcorn site) launched LabSmart, a unique new software-based process for auditing laboratories in view of maximising operational efficiency. Now commercially available, LabSmart is already being used in a variety of industrial laboratory settings, from formulation to biological assay labs. When the LabSmart audit highlights workflow bottlenecks that can be removed by the adoption of high throughput technologies (HTT), the InsightFaraday team of experts can advise on how best to implement existing commercial HTT or facilitate the development of new high throughput solutions tailored to the customer's needs.

The InsightFaraday team was recently successful in receiving DTI funding for a project developing HTT applications in micro- and nanotechnologies. InsightFaraday sponsored and was a member of the judging panel for the Chemical Industries Association (CIA) Innovation of the Year 2004 award, presented to Avecia for its work with Cambridge University on catalysts.

### REACH

In September, LGC and the CIA announced a joint initiative to create an independent support mechanism for the UK chemical sector in preparation for a system of Registration, Evaluation and Authorisation of Chemicals (known as REACH), that should come into force within the next couple of years.

LGC has organised joint workshops to exchange ideas on support mechanisms and to scope the potential role of a UK REACH Centre with representatives from supply and user

# Technology and innovation



*Senior analyst Stan Hoeck with research graduate Claire English - LGC's values include the promotion of sound analytical science and the development of its people.*

*From left: Samantha Braithwaite and Maxine Chow, LGC's legal team, handle the growing number of alliances, collaborations and contracts.*

industries, service and retail sectors, and trade associations. When established, the new centre will offer a range of chemical management support for health, safety and environmental compliance, and access to technical, business and legal specialists able to advise on all aspects of REACH regulatory requirements.

LGC is also setting up support mechanisms in other European countries, with a partner in Austria for the Polish chemical authority already in place. Progress on REACH Centre development is available at [www.reachcentre.com](http://www.reachcentre.com).

## International collaborations

Our major input into efforts designed to ensure the global comparability of chemical and biochemical measurements continues. The work is co-ordinated by the International Weights & Measures Organisation, the BIPM, for which LGC holds the chairs of the Bio (BAWG) and Inorganic (IAWG) Analysis Working Groups, through Helen Parkes and Dr Mike Sargent. We participate fully in the inter-comparisons organised by these and the Organic Analysis Working Group. The results of our work, reported at the annual meeting in Paris, showed good comparability with the other major NMIs. Amongst the studies reported were those for the analysis of selenium, arsenic, mercury and methyl mercury in salmon.

Also at the Paris meeting, the BAWG scoped out a road map to show how the work of the group would lead to improved comparability of biological measurements in this field, where the techniques of metrology are being applied for the first time. The BAWG also met in Beijing alongside a metrology

symposium hosted by NRCCRM, the Chinese reference material institute. Following the contact with NRCCRM, we are developing a fruitful collaboration with them on reference materials. At the invitation of CENAM, the Mexican NMI, we attended and presented at a workshop on chemical metrology and arranged a meeting of the IAWG alongside this event.

## European collaborations

LGC is one of a number of partners taking part in the EU Framework 6 project CO-EXTRA, the largest genetically modified food research project running in Europe. It aims to provide stakeholders in food and feed chains with a central decision support system. LGC's role is to contribute to the validation of detection methods and associated data handling techniques. InsightFaraday has received funding from the EU Framework 6 programme's 'TopCombi' project to explore the use of high throughput technologies in the search for new catalytic and environmentally sensitive chemical processes.

Established in 1989, Eurachem is a network of laboratories in 31 European nations making a significant impact on analytical science in Europe. It provides internationally accepted guidance on measurement uncertainty, method validation and accreditation for chemical, microbiological and R&D laboratories. The Eurachem General Assembly ratified the election of LGC's Dr Steve Ellison as Vice Chair at its annual meeting in Prague, to become Chair in 2006.

## Secondments

A number of LGC's staff were seconded in the past year to gain new skills and exchange scientific expertise. Peter Frier, a



*The MfB programme is developing methods for characterisation of biomolecules and validating analytical methods for bioprocess control.*

*From left: Lynda Lawrence receives her 'Technician of the Year' award from Dominic Moon, Commercial Manager of Laboratory News Forum.*

regulatory chemist, has been seconded to the Chemical Industries Association (CIA) to progress the joint UK REACH Centre; Chris Mussell, a mass spectroscopist, spent three months at the National Analytical Reference Laboratory (NARL) in Australia; Dr Rita Barallon, a molecular biologist, returned from DTI having worked on technology strategy; Sarah Morris, LGC's Senior Information Officer, spent time with the Patent Office.

### Promoting LGC's analytical work

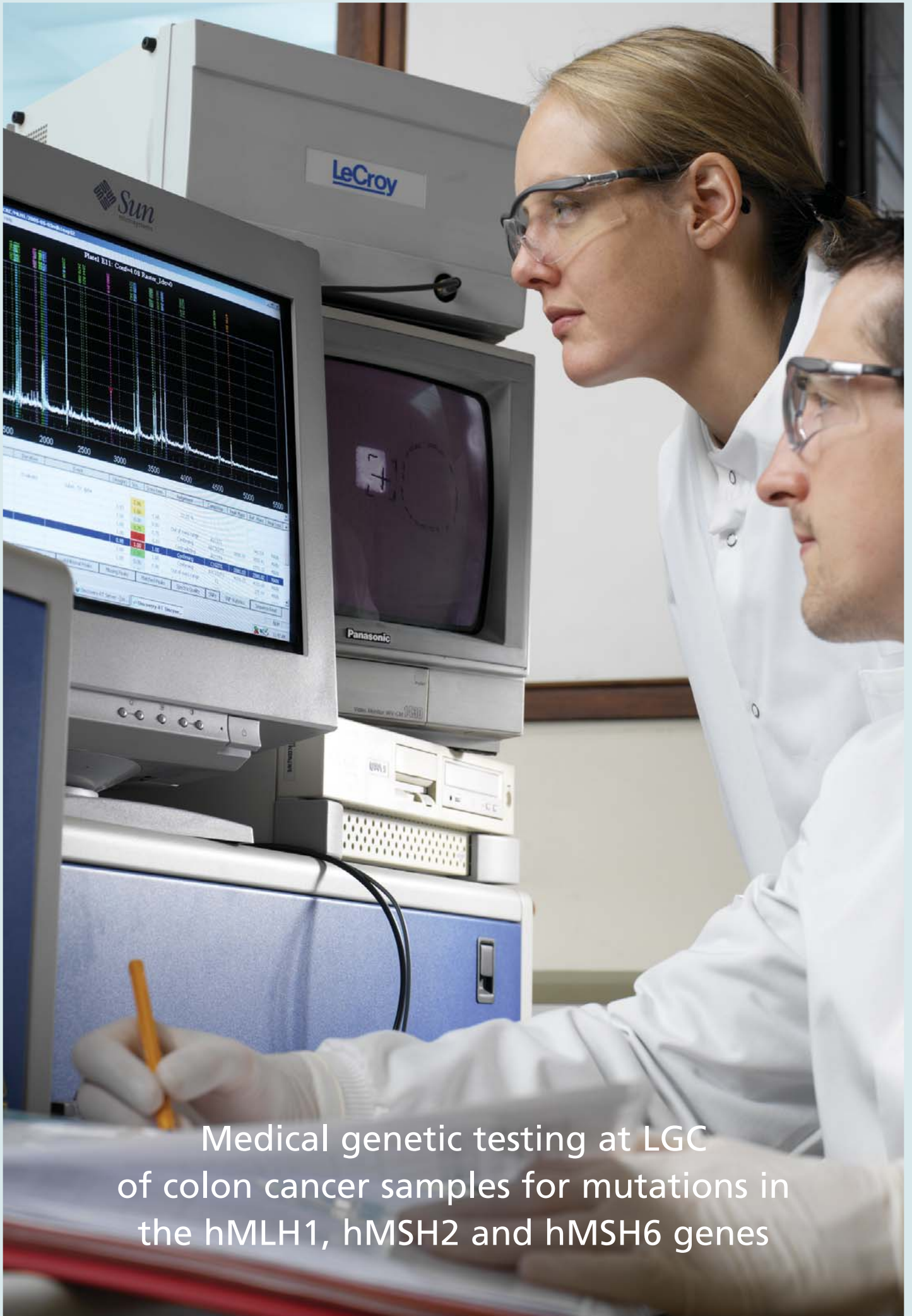
We value the promotion of our analytical work and actively encourage our staff to attend conferences and write papers. Mike Ludlow, an NMR specialist at LGC's Runcorn site, gave a presentation at the first international conference of Analytical Laboratory Informatics, held in June, about our role in the EU-funded project International Spectroscopic Databank, which also serves as an electronic archive for spectroscopic and associated data to help complete the gaps of known chemistry by reference spectroscopic databases. IS-DB encourages all scientists to submit data, which can then be shared with the rest of the scientific community free of charge.

Dr Peter Evans won 'best poster' at the Biennial National Atomic Spectroscopy Symposium about his work on the development of a high accuracy method for iodine analysis using isotope dilution mass spectrometry. Lynda Lawrence, based in LGC's hydrocarbon oils team, was awarded 'Technician of the Year' by Laboratory News. Dr Keith Anderson, of LGC's Drug Discovery Services, presented a poster at Drug Discovery Today in March, detailing collaborative research between LGC and NIBSC.

The project, supported by DTI's MfB programme, aims to provide guidance for industry on technical aspects of Caco-2 testing, improving industry-wide performance of the assay.

We also publish in the region of 30 peer reviewed papers annually. One of these, "A comparison of rapid bovine spongiform encephalopathy testing methods on autolysed (degraded) bovine brain tissue" (J Vet Diagn Invest, 2005, 17,(2) 99-102), was co-authored by Indu Patel, manager of the BSE laboratory in Teddington, with colleagues from the Veterinary Laboratories Agency (VLA). Another published paper was based on our veterinary drug residue work for Defra entitled, "An analytical method to determine conjugated residues of ceftiofur in milk using liquid chromatography with tandem mass spectrometry" (Anal Chim Acta, 2005, 529(1-2), 151-157).

In collaboration with the University of Southampton, Dr Tony Bristow has developed and evaluated a dual inlet device, which significantly improves the mass accuracy of measurements made on FT ICR mass spectrometers (Rapid Commun in Mass Spectrom, 2005, 18(24), 3035-3040). Finally, Dr Jacquie Keer and colleagues at LGC and the Institute for Reproductive and Developmental Biology have published our work on an improved method for quantifying circulating foetal DNA in maternal blood, which is of importance for non-invasive pre-natal genetic testing (Clin Chem, 2005, 51(2), 312-20).



Medical genetic testing at LGC  
of colon cancer samples for mutations in  
the hMLH1, hMSH2 and hMSH6 genes

# Analytical and diagnostic services



*From left: The DNA operations team - Nicola Woodyatt, Marie Barrett, Caryn Saunders, Ian Johnston, Simon Bardill and Leo Enright - meeting at our Runcorn site.*



*Analysis of footwear marks - one of the new forensic services available from Runcorn.*

**LGC provides a diverse range of analytical and diagnostic services for public and private sector customers in food, forensic, chemical, environmental, pharmaceutical, medical and life science applications.**

## New forensic services

LGC advanced plans to broaden the range of its forensic services during the year. New laboratory facilities at our Runcorn site will enable the analysis of blood patterns, fire debris and fire investigation, paint, glass, fibres, building materials and footwear marks. We will provide 95% of all types of forensic services regularly used by clients across England and Wales. We have developed partnerships with specialists, for example soil scientists and entomologists, to meet the occasional vital need for the remaining 5%.

Our new services will see more senior forensic biologists working alongside their reporting officer counterparts in forensic chemistry. We will also be stepping up our crime scene attendance, particularly for fire investigation, footwear mark and blood pattern analysis.

Customer feedback shows that LGC's forensic teams have consistently met and regularly exceeded customer requirements throughout the year, not least in the crime scene DNA teams where rapid turn round times have enabled police customers to make early positive identifications in both rape and murder cases. We were awarded a major new project by

the Metropolitan Police to analyse samples as part of a drive to disrupt organised criminal networks supplying street dealers with Class A drugs such as heroin and cocaine. Our forensic drugs and DNA teams are working in collaboration to compile intelligence data about the drugs and their associated wrappings and concealments.

The toxicology team has embarked on an extended contract which will run to 2010 for the Ministry of Defence's (MOD) Compulsory Drug Testing programme, which includes testing for drugs in both hair and urine samples. LGC competitively tendered to continue the work, having held the previous contracts since 1994.

The Digital Crime Unit moved into a dedicated suite at our Teddington site in November, with an increased capacity to analyse digital evidence linked to criminal activity from computers and mobile phones to CD-ROMs and cameras. New staff joined the questioned documents team and new reporting officers graduated from LGC's in-house training course.

LGC is one of the UK's largest independent laboratories for DNA testing. With the increased public interest in DNA profiling techniques (the most conclusive method of determining family relationships), an online FAQ facility was launched in September - via our website - to provide accurate, jargon-free public information and confidential online or telephone contact points.

# Analytical and diagnostic services



*Stella Harris in our scrapie genotyping laboratory where work continues under Defra's National Scrapie Plan.*

*From left: Richard Worswick and James White, Chief Executive, Osmetech plc, signing LGC's first HyBeacons® licence agreement to use our DNA probe technology.*

## Food chain and environment

LGC has worked with Defra and the meat industry to put systems in place in readiness for the managed transition towards anticipated changes to the Over Thirty Month (OTM) rule announced in December 2004. This has involved setting up abattoir trials and visits and establishing computer links. Since November 2001, our BSE laboratories in Edinburgh, Runcorn and Teddington have collectively processed over 730,000 bovine brainstem samples under the OTM scheme.

LGC successfully tendered to continue its scrapie genotyping work for Defra under the National Scrapie Plan first awarded in 2001. After a thorough review and evaluation, the contract was renewed in October 2004. Our scrapie genotyping services were also exhibited in Ireland at the 2004 National Ploughing Championships in County Carlow.

Other important contributions towards maintaining national standards and quality in the food chain were made by LGC's pesticides and veterinary residues teams as part of current surveillance contracts for the Pesticides Safety and Veterinary Medicines Directorates respectively, and in our role as the UK's National Reference Laboratory for animal feedingstuffs.

Our food chemists were awarded contracts by the Food Standards Agency to develop and validate new methods for the identification and quantitation of various food additives. They also examined a record number of referee samples submitted to the Government Chemist at LGC under the provisions of the Food Safety Act 1990 and the Agriculture Act 1970. Many analytical challenges were presented, including

the identification of irradiated food, the determination of mycotoxins in feeds and the understanding of the variability in calcium concentrations in fortified soya milk.

Issues in environmental protection were addressed by LGC's environmental team as part of a broader remit, stretching from contaminated land and building site surveys to radiochemistry and waste management. The environmental team's scientific expertise are augmented by contributions from colleagues with specialist skills in occupational safety and health, bulk asbestos sampling and analysis and radiological protection, amongst others.

## Medical and life sciences

Novel analytical opportunities in the human healthcare sector are emerging from the current global investment in genome research and technology. For LGC's life sciences team, recent activity has focused on developing technologies for the diagnosis of inherited predisposition to illness, improving response to medication and the rapid genetic definition of infections.

LGC processed its first commercial medical genetic tests in March when we received an order to test colon cancer samples for mutations in the hMLH1 gene. This is a significant breakthrough in establishing our reputation in this new and important analytical sector for LGC. The work was built on validation of our specialist colon cancer gene analysis that had been achieved through collaboration with key NHS regional genetics laboratories. Pioneering use of mass spectrometry combined with the development of proprietary software has enabled cost-effective analysis of the gene sequence.



*Over 730,000 bovine brainstem samples have been processed by our three BSE testing laboratories since November 2001. Joe Roberts is pictured in our Runcorn laboratory.*

*Neil Malone testing physical properties of pharmaceutical drugs at our Runcorn site.*

In December, LGC granted its first commercial licence to Osmetech plc to use its HyBeacons® technology, which was part-developed with DTI support under the LINK Analytical Biotechnology programme. The HyBeacon DNA probes have unique characteristics that make them suitable for very rapid diagnostic and point-of-care applications. Osmetech will use this first licence in medical genetic test applications for analyte specific reagents (ASRs) that indicate inherited genetic traits.

Research during the year has established the application of HyBeacon technology for the detection of infectious human pathogens such as MRSA and influenza. We already have a near commercial test for the diagnosis of human sexually transmitted diseases, including chlamydia, that has been trialled in a clinical setting at the Royal Free Hospital in London. Other potential applications suitable for licensing opportunities are being investigated.

LGC holds exclusive commercialisation rights for the key pharmacogenetic (CYP2D6\*4) test, which indicates poor drug metabolism, from the University of Dundee. We therefore welcome the long-awaited guidance (published in March 2005) from the US Food and Drug Administration (FDA) concerning pharmacogenomic testing associated with various stages of drug development. More utilisation of pharmacogenomic testing is likely as a result, in both clinical trials of new drugs as well as that pertinent to previously approved drugs. This should enable toxicity or efficacy correlations with particular gene markers, or gene expression changes, to be built into a greater number of drug development programmes at the earliest stage.

During the year, LGC continued to sub-license diagnostic test kit and pharmaceutical manufacturers to use the pharmacogenetic (CYP2D6\*4) test as a valid biomarker in their drug development products and processes.

### Pharmaceutical and chemical services

The creation of LGC's Pharmaceutical and Chemical Services division in 2004 reflects our commitment to providing a world-class service to the pharmaceutical and biotechnology industries. The new division combines skills and competencies in synthesis, biology and mass spectrometry with the analytical and product characterisation capabilities of the former Chemical and Process Industries division based at Runcorn.

### Mikromol

Mikromol, the pharmaceutical impurities company acquired by LGC in 2003, forms part of the new division. Its sales volume and product range continues to increase to support the growing generic pharmaceuticals industry. It is now the second largest company on the Biotechnologiepark in Luckenwalde, near Berlin in Germany. Staff numbers have more than doubled since acquisition, with additional synthetic and analytical chemists joining last year. Business integration and cross-centre interaction with other businesses within the LGC Group is increasing, one example being the secondment of Chrissy Sieber from Mikromol to synthesise new stocks of a best-selling compound in Teddington.

# Analytical and diagnostic services



*From left: Selvarani Elahi, Dr Jon Bell, Chief Executive, Food Standards Agency and Ian Lumley discuss LGC's research and surveillance for the Agency.*

*From left: Ric Treble receiving a Certificate of Appreciation from the Deputy Chief of Defence Staff, Lieutenant General Anthony Palmer CBE.*

## Analytical outsourcing

Several multinational companies have placed outsourcing contracts with LGC for specialised chemical analysis. These wins, delivered from our Runcorn site at The Heath, represent LGC's most significant developments in outsourcing since we acquired ICI's analytical support laboratory in 1998.

We have made significant investments in instrumentation to enhance related services, including equipment for particle sizing and the testing of other physical properties of pharmaceutical drugs, and improved capability for characterising the inorganic content of customer samples. Our operations are now fully flexible so that we can adapt to high sample volumes where necessary.

## Developing pharmaceutical offerings

By continuing to combine and enhance our in-house strengths and skills in synthesis, certification and characterisation, and by working with companies with whom we have a range of alliances and collaborative agreements, we aim to provide customers with comprehensive services in reference materials, analysis and materials characterisation.

Working with AKOS, a UK-based drug development and regulatory affairs consultancy, Dr Derek Craston, Head of LGC's new Pharmaceutical and Chemical Services division, co-authored a presentation for Genesis 2004 entitled, "Added quality means added value", delivered by Jenny Vestal, VP Regulatory Affairs at AKOS.

## Recognition

The MOD marked the testing of the one millionth urine sample in its Compulsory Drug Testing programme at an event in January at Trenchard Lines in Upavon, Wiltshire, the Adjutant General's Headquarters. Deputy Chief of Defence Staff (Personnel), Lieutenant General Anthony Palmer CBE, presented LGC with a certificate of appreciation for our work in support of the programme.

## Sharing analytical practice

Many high profile visitors came to see LGC at work during the year. Dr Jon Bell, Chief Executive of the Food Standards Agency, was able to discuss how we perform research and surveillance work for the Agency, and relevant food standards work for Defra and the Government Chemist. Members of the Scottish Association of Meat Wholesalers toured our BSE testing operation in Edinburgh, and a party from the Republic of Georgia visited Teddington as part of a World Bank project to gain a better understanding of the functional food control systems within the UK and EU.

Forensic staff participated in a three-day training event in London for the British Transport Police, sharing details about how we analyse and examine, for example, crime scene DNA and drug seizures. LGC also hosted a seminar in Birmingham on developments in forensic analysis for the Association of Chief Police Officers, including an update on our HyBeacons® work to develop portable DNA forensic testing.

# Process and operational efficiency



*LGC offers a wide range of specialist services to the pharmaceutical R & D and manufacturing sectors.*

*From left: Nigel Law meets Prime Minister Tony Blair at LGC's site on The Heath in Runcorn during the election campaign.*

**Automation has been an important recent initiative at LGC, providing the structure and momentum for operational advances in several teams where it is perceived to add value to the process.**

The first area to be formally reviewed was hydrocarbon oils, where forensic analysis is performed for HM Revenue & Customs (HMRC) Road Fuel Testing Units. As a result, turn round times have decreased, more samples are being processed and additional services for HMRC are more easily accommodated.

One of Nigel Law's first innovations as LGC's new Chief Executive has been to extend the brief beyond the concept of automation, expanding its scope to be laboratory-wide. The main drivers have been to gain additional capacity and the correct and efficient utilisation of laboratory and office space, equipment and staff resource.

Process and operational efficiency are now being evaluated more broadly to include not only the merits of automation, but also to involve a systematic focus on methods and workflows throughout our business.

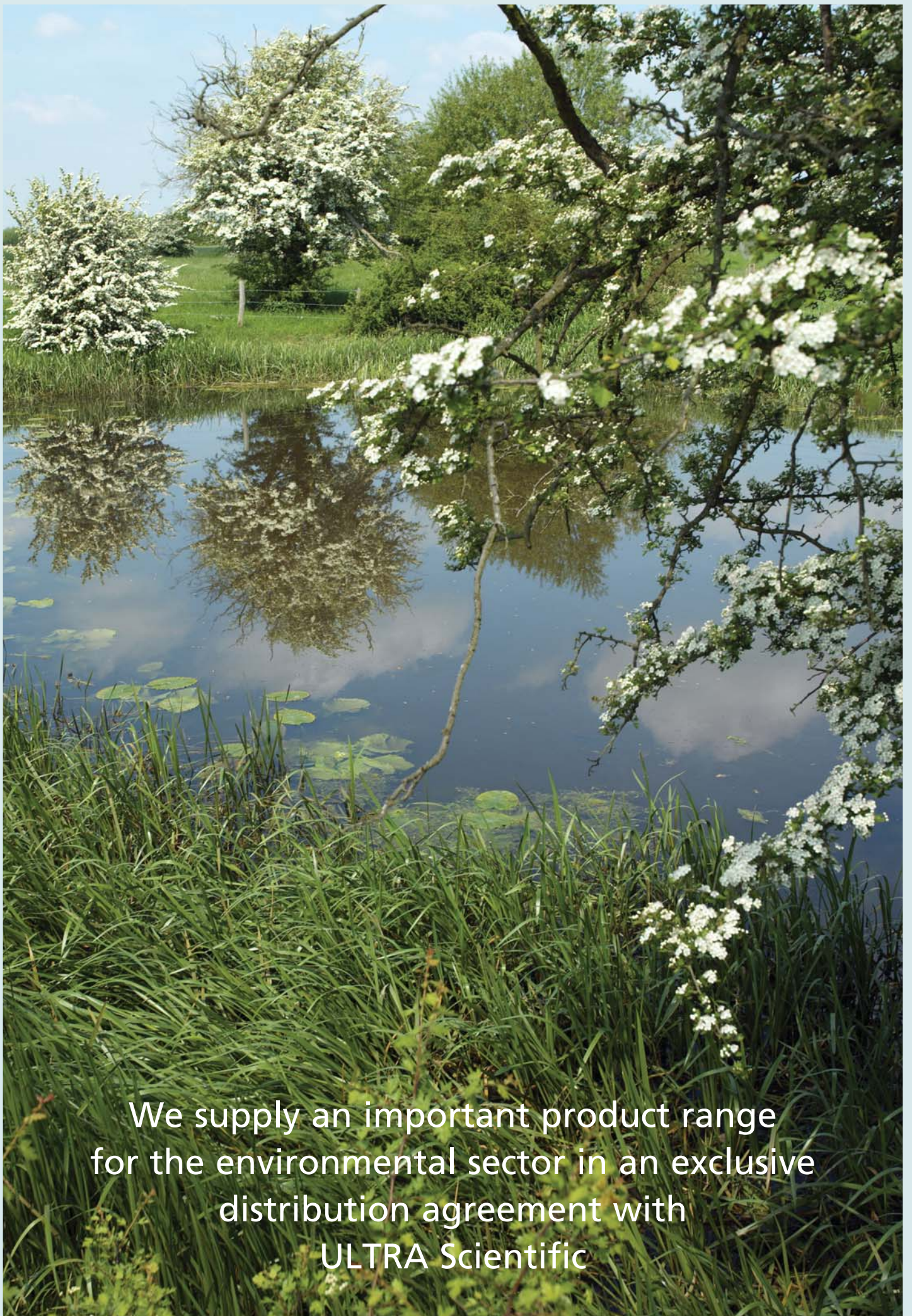
This alignment of the process and operational efficiency team (POET) more closely with the challenges that the company faces in the future, should help to accelerate the rate at which the company can enhance its overall productivity.

The aim is to have a fuller understanding of the untapped potential at the Teddington site and to understand the resources and requirements necessary for that potential to be realised in increased productivity, capacity and cost-effectiveness.

Ben Fairman, LGC's Technology Development Manager, who leads the POET initiative is reviewing current practice with teams in crime scene DNA, veterinary drug residues and forensic drugs in Teddington, and with the pharmaceutical and chemical service and criminal justice teams in Runcorn.

**Insight**  
High throughput technologies

POET is using InsightFaraday's new laboratory audit software - LabSmart - as part of the analysis of each team's operations and in identifying critical improvement factors.

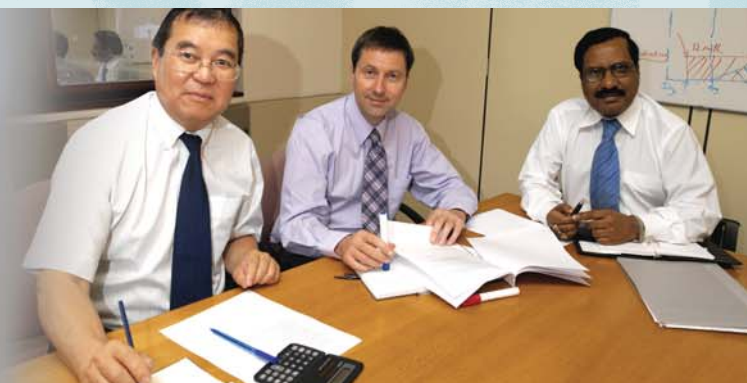


We supply an important product range  
for the environmental sector in an exclusive  
distribution agreement with  
**ULTRA Scientific**

# Reference materials



*From left: Suzannah Mackay and Emma Mann, of LGC Promochem's global internet marketing team.*



*From left: Dr Ray Ah-Sun, Director, Business Development in conference with Dr Derek Craston and Sury Rao of LGC's Pharmaceutical and Chemical Services division and LGC Promochem India respectively.*

**LGC Promochem, the division responsible for the supply and distribution of reference materials, once again achieved good sales growth. Already Europe's most comprehensive source of reference materials, this year we added more products to our range and extended our geographical reach.**

## Customer focus

In our continuous programme to ensure that our customers experience excellent service, we have recruited staff to serve Finland, the Baltic States and Hungary. Laboratories in the countries which entered the European Union in May are keen to improve the quality of their analyses and we anticipate seeing a substantial increase in demand from these territories over the next few years.

Our Polish office is already reflecting this strong market growth. The staff have played a major role in hosting seminars at Polish universities, discussing the importance of reference materials in ensuring the accuracy and quality of analytical measurement. These have been well-attended events, reflecting the interest in sharing best practice. A similar seminar was organised at the University of Riga, Latvia, attended by scientists from a variety of disciplines.

We have taken new steps to improve customer focus using internet searches and telesales to reach potential customers in territories where we have no local representation. This is proving to be an important tool for finding out about customer needs outside our established territories.

We have taken steps to improve the efficiency of our UK operation by consolidating our activities in Teddington, making it easier for customers to order from us. We are continuously upgrading our website, which is a vital tool for our business.

## India

Our operation in India has achieved particularly high growth rates over the past year and set the record for the highest number of pharmacopoeia reference standards sold in a single month in December 2004. LGC Promochem India opened a third sales office in Hyderabad to better serve customers in this important and fast growing city for pharmaceutical and biotechnology companies.

From just two members of staff in 1995, LGC Promochem India's experienced teams in Bangalore, Mumbai and Hyderabad have earned an unrivalled reputation for their expertise in reference materials. Last year, Dr Sridhar, an authority on chromatography from the Indian Institute of Science, joined the company to develop non-pharmaceutical product lines.

# Reference materials



*ATCC kits for apoptosis detection are now available in Europe through LGC Promochem.*

*ATCC head office in Manassas, Virginia, USA.*

*LGC Promochem has extended its distribution agreement with ATCC for a further five years.*

## New distribution agreements

This year we signed an agreement with Poland's Institute of Industrial Organic Chemistry which gives us exclusive rights to distribute its range of reference materials throughout the world.

Our close relationship with ATCC was further strengthened when we signed an agreement allowing continued exclusive distribution in Europe for five years. The agreement also allows us to offer our customers a substantial increase in the products we hold in stock. This important step will mean that European customers have quicker and easier access to ATCC products and many customers will receive their deliveries within just two days.

in partnership with **ATCC**<sup>®</sup>

*"ATCC and LGC have furthered their goal of achieving global market leadership in cell biology and microbiology by committing to a five year distributor and development agreement."*

Raymond H. Cypess DVM, Ph.D.  
President and CEO of American Type Culture Collection

We are also launching a number of exciting product ranges from ATCC in a number of research areas such as cell immortalisation, apoptosis and molecular biology.

ULTRA Scientific is a long-standing supplier with whom we signed an exclusive distribution agreement during the year. We see ULTRA's ability to supply ready-to-use standards in solution, not only from their extensive catalogue but also as customised solutions, as an important part of our product range for the environmental sector. Interest from our customers in products made to their own requirements has been reflected in a high response rate to our custom solutions mailing pack.

Another important addition to our product range has resulted from our agreement with the National Measurement Institute Australia (NMIA). This allows us exclusive rights in Europe to distribute NMIA certified reference materials. This includes an important range of standards to assist in the detection of steroid abuse in sports, including horse racing.

We also finalised talks with Cerilliant earlier this year to be able to offer their expertise in the manufacture of ready-to-use solutions of pharmaceutical impurity standards, for sale in the USA from Cerilliant and in Europe from LGC Promochem.

## Our people

Investment in our staff has been an important feature of our activities in 2004. Our Technical Manager, Dr Christian Zeine, spent a month on secondment with our pharmaceutical reference standards partner, USP. During this time he attended



*From left: Tilo Karrer, Ulrike Westkamp, first female Mayor of Wesel, Johannes Opgen-Rhein, Head of Business Development Authorities and Eike Griess at LGC Promochem, Wesel.*

*The pharmaceutical impurity reference materials range from Mikromol continues to increase to support the growing generics pharmaceutical industry.*

training courses and worked closely with USP staff in Rockville, Maryland. The experience was extremely valuable, adding to our technical knowledge of USP's products and assisting us in answering enquiries from our customers. We plan to enable other staff to be sent on secondments with other suppliers.

Our Wesel office in Germany played host for six months to Dr Caroline Jones, Business Development Manager for our General Reference Materials range. This was an important secondment as Germany represents our largest European market and we have been able to gain a greater insight into our customers and their needs.

The generic pharmaceuticals market in the USA is growing at 10% per year. Our range of pharmaceutical impurity reference standards is of great interest to laboratories involved in method development and impurity testing. In order to investigate this opportunity more thoroughly Morris Legge, International Business Development Manager, has been working in the USA, visiting existing and potential customers and discussing their impurity standards requirements. The information gained will inform our decision about how best to operate in this important market.

In addition to these secondments, we have training programmes in place for our staff covering project management, selling skills and hands-on cell biology techniques. We have also welcomed many of our suppliers to our staff training sessions, including the European Pharmacopoeia (EP), Cerilliant, NMIA and ATCC.

## Our profile

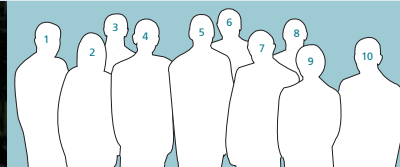
We received an important visit from the Mayor of Wesel, Mrs Ulrike Westkamp, in January, who expressed a great deal of interest in our operation and the success of our business in Germany.

Our promotional activities during 2004 included attendance at some key international exhibitions. In December we shared a booth, as in previous years, with USP at the Convention of Pharmaceutical Ingredients exhibition in Brussels. We were able to meet customers from all over Europe and many from the Far East.

Following last year's successful European launch, the European Reference Materials (ERM®) range was launched in the USA at the Pittcon exhibition in March. This range of products is the result of collaboration between LGC and two other major European producers of certified reference materials: BAM (Germany), the Federal Institute for Materials Research and Testing, and IRMM (Belgium), the European Commission's Institute for Reference Materials and Measurements.

Our customers have commented on the ease of use of our market-focused range of catalogues and this year saw the production of new editions for our pharmaceutical, forensic, toxicology, clinical and environmental ranges of products. These are important in keeping our customers updated with new products that are being offered from LGC's Mikromol pharmaceutical impurity range, and products from many other suppliers including USP, EP and Cerilliant.

# The Board of LGC Group Holdings plc



- |                     |                   |
|---------------------|-------------------|
| 1. Uwe de Buhr      | 7. Ian Kent       |
| 2. Joanne Parfrey   | 8. Brian Phillips |
| 3. Geoff Battersby  | 9. Maxine Chow    |
| 4. Richard Worswick | 10. John Mason    |
| 5. Nigel Law        |                   |
| 6. Lord Stevens     |                   |

The Board of LGC Group Holdings plc is as follows:

## **Ian Kent (61) - Chairman and Non-Executive Director**

Ian Kent was appointed to the Board of LGC (Holdings) Ltd in May 2001, becoming Chairman in July 2001. He is Chairman of ML Laboratories plc, Argenta Discovery Ltd, Intercytex plc and Plamed Ltd. He is a Non-Executive Director of Ardana plc.

## **Dr Richard Worswick (58) - Deputy Chairman**

Richard Worswick was appointed Government Chemist and Chief Executive of LGC in 1991. In 1996 he led a management buy-out and became Chief Executive of the new company. He was Government Chemist from 1991 until June 2002. He became Deputy Chairman in April 2005.

## **Dr Nigel Law (51) - Chief Executive**

Nigel Law was appointed Director, Group Operations in November 2002. He joined LGC from Hoyer, having previously held various operational and marketing roles with Exxon Mobil, and a period with Mercer Management Consulting Ltd. He became Chief Executive in April 2005.

## **Geoff Battersby (45) - Group Finance Director**

Geoff Battersby was appointed Group Finance Director in November 2004. He has financial management experience of a variety of sectors gained with Young's Bluecrest Seafood, PricewaterhouseCoopers, Wickes plc and Arthur Andersen, amongst others.

## **Dr John Mason (46) - Director, Corporate Development**

John Mason, appointed Executive Director in April 2000, joined LGC from AEA Technology in 1994. He became Director, Corporate Development in 2002 with responsibility for the Group's human resources and marketing functions. He is also a Director of Chemicals Northwest Ltd and head of LGC's Runcorn site.

## **Uwe de Buhr (60) - Non-Executive Director**

Uwe de Buhr was appointed to the Board of LGC Group Holdings plc in December 2004, having been a consultant to the Group since 2001. He has held sales, marketing, management and acquisition roles with several chemical companies in Germany and across Europe, including Harcros Chemicals (formerly Lankro). Since 1995, he has worked as a consultant to the chemical industry.

## **Joanne Parfrey (32) - Non-Executive Director**

A chemist by training, Joanne qualified as a chartered accountant with Arthur Andersen in 1998. She was subsequently a corporate finance executive with The BOC Group and Elementis plc. She joined LGV in October 2000. She is also on the Board of Hayley Conferences Centre Ltd.

## **Brian Phillips (45) - Non-Executive Director**

Brian Phillips joined KPMG in 1980. In 1984 he joined 3i on secondment. He returned to KPMG Corporate Finance for two years, before joining INVESCO Ventures in 1987 as a Director. In 1993 he joined Gartmore Private Capital and, on their integration in 1996, NatWest Equity Partners (Bridgepoint). He joined LGV in September 2000.

## **Lord Stevens (62) - Non-Executive Director**

Lord Stevens, formerly Sir John Stevens, retired as Commissioner, Metropolitan Police, in January 2005 after over 40 years in the police service. He joined the Board of LGC Group Holdings plc in March 2005.

## **Maxine Chow - Company Secretary**

During the year, the following resigned as Directors of LGC Group Holdings plc.

**Dr John Beacham CBE - Non-Executive Director**  
**Clive Hall - Group Finance Director**