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## FEATURE ARTICLES

### The professionals' dilemma?

#### *Building sustainable development into professional practice*

Stephen and Maureen Martin

All over the world professionals and practitioners in a wide range of public and private sector roles have begun to explore the opportunities and challenges of sustainable development. However, exploration is not action and meaningful change is only just beginning. For all the debate about 'the next industrial revolution', by and large we keep making, selling, using and disposing of the same products.

Among the 5.5 million people in the UK who call themselves professionals, there is a growing realisation that they need help in understanding how to put the principles of sustainability into practice. Why is this happening? Why are doctors, lawyers, surveyors, civil engineers and, belatedly, a growing

number of accountants beginning to call for more help and guidance from their professional associations? The fact is that professionals in all sorts of roles must demonstrate their competency throughout their professional life, in complying with a growing and complex set of environmental, social and ethical issues. As the chairman of the British Medical Association's medical ethics committee stated recently, 'The days when patients simply left it to doctors to try what they thought best are over.' Another high profile commentator suggested that 'we have gone from a trust me culture to a show me culture' – which is why there is a new and growing emphasis on occupational standards, competency and codes of conduct.

Sustainable development is as much about ethics and values as it is about environmental protection and mitigating environmental impacts. It is important to distinguish between 'ethics' – a code of conduct which prescribes what professionals should or should not do – and 'values' which refer to things professionals aim towards and regard as valuable or good in some sense. Any approach to sustainable development will have values and ethical principles embodied within it. For example, a transport engineer may ask why traffic pollution should concern us. The answer presumably is because it adversely affects human welfare. This raises a straightforward ethical issue about limiting activities which cause serious harm to others. There is also explicit reference to human welfare as something we value. Every time a manager considers how to balance the value put on safety against the value put on reducing costs, they are dealing with an ethical issue and are being required to make an ethical judgment.

Recent accounting scandals have led to criticisms of practices that permit accountancy professionals to provide additional consultancy services to the companies they audit. However, the underlying

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problem is essentially one of ethics – how can auditors maintain their independence if companies are paying them directly? Regulators and lawmakers will need to consider much more fundamental solutions to this vexed problem. Labour MP Austin Mitchell, one of the accountancy profession's most scathing critics, says 'the UK accountancy bodies have always behaved like trade associations, not guardians of public interest. They seek economic advantages for their members. They lobby government departments to protect their interests. They aim to shift the tax burden from the rich to the poor... Rather than ethics, social responsibility and professional judgment, accountants shelter behind the latest accounting and auditing standards and their self protecting ingenuities.'

A real dilemma for professionals is that ethics and values are not given the same priority as science and technology. A common but profoundly mistaken belief is that while science is 'hard', objective and based on empirical evidence, ethics and values are 'soft', subjective and entirely personal, like tastes. Issues of right and wrong, good or bad are not like a preference for red as opposed to white wine. Ethics are based on reason and reason can be subject to rigorous analysis. These are crucial issues for professionals, but if they treat them as superficially as taste, then they are unlikely to subject them to rational adjudication and debate.

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***'Professionals are responsible not only for the safety, technical and economic performance of their activities, but they also have responsibilities to use resources sustainably...'***

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It was Tolstoy who wrote that the greatest threat to life is habit. Habit, he argued, destroys the things around us by familiarising us to the extent that we can no longer see them. We become incapable of bringing the familiar furniture of our personal and professional lives into focus. In a similar vein, we often take for granted the ideas and concepts as well as the intellectual frameworks within which our ideas and concepts exist. Concepts such as the environment, nature, civil society, are familiar, yet they are difficult to define, partly because they carry with them a baggage of assumptions, which influences the way we think about a range of contemporary issues. Professionals are no different: their beliefs and values are largely defined by their long education and training in their basic discipline. So our university system is part of the problem and not the solution! Yet in spite of special government commissions, national curriculum initiatives and concerted efforts by powerful NGOs 'a typical university graduate does not recognise that the consumer lifestyle is ecologically unsustainable'.

It is important to recognise that a significant number of professional bodies play a key role in defining

the curricula of higher education programmes which prepare students for a specific profession. This is because many professions have been phasing out their own examinations and now rely on 'accredited' degrees as the educational route to membership.

In the UK a number of professional bodies have begun to recognise that sustainable development is a key issue to their members. Some, like the Engineering Council are actively revising and updating their 'Code of Professional Practice' and setting up working groups to discuss topics such as ethics, values and the sustainability agenda. The Institution of Environmental Sciences with 12 other professional bodies has developed a range of sustainable development training support materials for professional practice and the Royal Town Planning Institute has been a major player in developing a European Sustainable Development Guide for practitioners in the EU. This is good news, because most of the professional institutions and educational institutions have until recently demonstrated considerable indifference to this issue.

The Government's Sustainable Development Education Panel has also set out a number of strategic goals for the professions. It recommends that by 2010 all professional bodies and industry lead bodies should have sustainable development criteria included within their course accreditation requirements.

Professional bodies are increasingly being asked to review their traditions and practice both radically and urgently to meet the needs of their existing membership. This has far reaching implications for universities. Many universities in Europe ratified their commitment to 'a leading role in developing a multi-disciplinary and ethically-orientated form of education in order to devise solutions for problems linked to sustainable development' in the Copernicus Charter (1993). However, implementation of these principles has proved to be much more difficult and progress is frustratingly slow. This will be a major challenge to the newly created Universities UK/SCOP – Sustainability Committee of Vice Chancellors and Principals.

The challenge of sustainable development has profound implications for the engineering, planning, chemical, environmental, accounting professions and many others, in both the practice and role of the professional. Professionals are responsible not only for the safety, technical and economic performance of their activities, but they also have responsibilities to use resources sustainably; to minimise the environmental impact of projects, wastes and emissions; and to use their influence to ensure their work brings social benefits which are equitably distributed. These responsibilities heighten the importance of ethics in curriculum design and will require greater emphasis on codes of conduct and the role of professionals as social change agents.



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# Science, the environment and government

*Professor David King FRS, Chief Scientific Adviser*

The recent outbreak of foot and mouth disease in the UK was a major problem but scientists have identified and successfully solved environmental problems on a global scale before. When I was in the chemistry department at Cambridge we were looking at the effect of CFCs on the ozone layer and we assembled a strong multi-disciplinary team of chemists, physicists and mathematicians together with massive computer capacity to model the upper atmosphere in three dimensions.

This work led to the international agreement to ban CFCs, the first scientifically based international agreement of its kind. The present observations are that the stratosphere is recovering as the model predicted it would. The stratosphere is now being modelled with some degree of accuracy.

Modelling the lower atmosphere to identify and predict the effects of the burning of fossil fuels is more difficult, but this is being done at Hadley centre in the Met Office, the international leader in this field. From 1000 AD until near the present time the carbon dioxide concentration in the atmosphere was steady at 270 to 280 ppm despite the explosion in the world population during that time, but in the last few decades the CO<sub>2</sub> concentration has been increasing and is now 370 ppm and the planet is warmer by about 2 degrees. Carbon dioxide is particularly damaging because it builds up in the atmosphere and (unlike methane, another greenhouse gas) persists for a long time.

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***'Scientists have identified and successfully solved environmental problems on a global scale before...'***

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If we continue burning fossil fuels as we are doing now the CO<sub>2</sub> concentration by 2100 AD will rise to about 750 ppm and the consequent increase in temperature will have serious effects. The rise in the sea level will submerge the low lying parts of the world, including parts of India and south east Asia where flooding will displace millions of people who will become refugees. We need international agreement to try to limit the production of CO<sub>2</sub> to 550 ppm, a figure recommended by the IPCC.

We need to act today in order to try to mitigate future problems and to overcome the inertia in the system. The DTI has started a new Foresight programme which concentrates on just three or four major problems. One of these problems is coastal flooding which will become more serious for us in this country both because the sea level is rising and because storms are becoming more frequent.

Foresight programmes are being followed in other European countries which are using ours as a model. The major oil companies Shell and BP are re-labelling themselves as energy companies and are leading the way in recognising that to meet the demands for energy in the future and to bring the effects of climate under control we will need to harness other resources.

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***'The commercial value of all these developments could be significant...'***

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For our future energy strategy we need a range of low carbon options while maintaining a liberalised energy market and a regulation on climate change. We need to stimulate the deployment and research into these options. This is recognised in the recent FIU Energy Review. At the request of the Government I undertook a review of energy research in this country; to compare it with the work in other countries and the report of the Energy Research Review Group has been published recently. These results are included in the Energy Review.

There are six key areas for future Research, Development and Demonstration (RD&D) activities. These include solar PV panels, carbon sequestration, energy efficiency, hydrogen as a fuel for transport, and ideas for wave and tidal power. Johnson Matthey are an international leader in fuel cell development and Imperial College has developed a tidal power device with no moving parts below sea level. The commercial value of all these developments could be significant.

Nuclear fusion offers a very attractive possibility in the long term. Its basic fuels, deuterium and lithium, are virtually inexhaustible, and the ash is helium which is not radioactive. The system is safe in the event of an accident. The present work at Culham is leading the world and the Culham design is an improvement on the original Russian design. JET (Joint European Torus) has produced everything that it promised and the next step is to build a larger version called ITER (International Thermonuclear Experimental Reactor) in which the energy multiplier will be at least ten. This will cost £4 billion over ten years.

In the meantime do we allow our nuclear fission stations to wind down over the next 20 years without replacement? The alternatives are between creating more carbon dioxide in the atmosphere or more nuclear waste, which we are creating anyway with our missile programme. The fact remains that foreclosing the fission option would be inconsistent with an informed grasp of the real urgency with which the threat of climate change must be faced.



# Rendezvous at nightfall: the voyages of robot ocean explorers

Professor Gwyn Griffiths,  
Southampton Oceanography Centre

The oceans are an essential part of our planet's life support system. Their vastness makes obtaining information from their interior both difficult and costly. This presentation looks at how advances in robotics technology can advance our fundamental understanding of the role of the oceans and the processes operating therein.

About ten years ago a number of ocean engineers developed a vision of how the rapid development of microelectronics, high-strength materials (especially composites), satellite communications and navigation could be harnessed to obtain routine measurements from the body of the oceans and relay them back to shore. These autonomous underwater vehicles would be robot ocean explorers of the future.

Three main areas of application were envisaged: to gather information from the interior of the ocean on physics, chemistry and biology; to follow the seabed and use sonar to image the ocean floor; and to explore inaccessible areas beneath polar ice shelves in the Arctic and Antarctic.

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***'Undoubtedly, the next generation of engineers and scientists will take autonomous underwater robots much further...'***

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At the end of the 1980s we started on the Autosub programme, funded by the Natural Environment Research Council (NERC), to bring this vision to reality. The early years were spent on research and development on individual sub-systems such as the propulsion motor, the autonomous navigation sensors and the pressure vessels to enclose the components. The vehicle itself was built in 1996. Under the banner of a NERC programme 'Autosub Science Missions' that ran from 1999-2002, Autosub missions have solved a number of problems in ocean science. It has answered questions from fisheries scientists who wanted to know whether fish avoided their survey vessels because of the noise generated by the ship. Information from Autosub has helped to clarify scientists' understanding of how energy from the wind gets transferred into the sea surface. It has made chemical measurements in Scottish sea-lochs to assess the degree of anoxia and biological measurements of phytoplankton off the Scilly Isles.

In an excellent example of the benefits of a robotic ocean explorer, Autosub studied the distribution of krill in open waters and under sea ice in the Antarctic. Krill are a shrimp-like animal (*Euphausia superba*) and are

a fundamental part of the Antarctic marine food chain. They are about 50mm long, swim in swarms and it has been an open question as to their distribution with respect to sea ice, because until now they could not be studied in their natural environment without disturbing that environment. Taking an icebreaker through the sea-ice to make the measurements would destroy the very environment, for example. A submarine, with its sonars looking up towards the underside of the ice was the ideal tool. In 2001, scientists used Autosub on several missions from open water to beneath sea ice and obtained a consistent result: the krill population was higher, by a factor of three, within a band 12 km into the sea ice, than in open water.

Using the same sonar as was used to investigate krill distribution, Autosub also measured the thickness of sea-ice in the Antarctic. While observations of sea-ice from ships or satellites estimate the freeboard of the ice (some one ninth of the thickness), looking from underneath, Autosub measures the draft (some eight ninths). This provides a more precise measurement of the total ice thickness, particularly when snow on the surface depresses the ice floes. As well as providing a more accurate measurement, in one expedition, Autosub provided more measurements of sea-ice thickness in the Antarctic than all previous expeditions that used manual ice coring.

NERC has a programme over the next four years to make measurements under ice shelves in Antarctica and Greenland using the Autosub robot ocean explorer. The first expedition, in early 2003, will focus on the environment beneath the 70 km long Pine Island Bay Glacier in the Amundsen Sea area of the Antarctic. The underside of this glacier is melting rapidly – some 10m a year. The vehicle will make measurements of the ocean circulation beneath the glacier, investigate the topography of the seabed and the relationship of the glacier to the sea-ice of the region. Later expeditions will take the vehicle beneath the Ronne Ice Shelf in the Weddell Sea, Antarctica and beneath the 79°N glacier on the north-east coast of Greenland in 2004.

Identifying a suitable source of energy was a problem in the late 1980s and it is still a problem today. The present vehicle uses batteries – primary manganese alkaline batteries that are familiar to us all. In the future, we expect to be able to use fuel-cells based on hydrogen or methanol, with the oxygen either carried on board, or extracted from seawater. Further into the future, such vehicles may mimic nature, and extract energy from their environment, from the biota.


The crucial ingredient for the progress with Autosub to date has been the team of engineers and scientists working together as peers. It was this close collaboration between engineers and scientists that made the



venture successful: the right people came together and made progress step-by-step. It is especially important to recognise the courage of the NERC in funding a long-term programme that kept the scientists engaged, while the engineers developed the necessary technology.

This success has encouraged industry to look at the benefits of underwater robot explorers. This has required businesses to develop new models for the way they gather information to reap the cost-reduction benefits that the technology brings. Not only are business costs being reduced by this technology, the quality of the data is far better than that provided from surface ships, subject as they are to the harsh environment of

the sea surface. In order to exploit Autosub technology, the NERC has granted a licence to Halliburton Subsea to build replica vehicles for use in the offshore industry. Halliburton see future underwater robots such as Autosub becoming the norm for providing seabed and pipeline route survey information to the industry.

Undoubtedly, the next generation of engineers and scientists will take autonomous underwater robots much further. To help enthuse children in the challenges of working with this technology in service of the environment a full-size model of Autosub forms part of the Planet Ocean gallery at the National Maritime Museum in Greenwich. 

## Green chemistry

*Professor James Clark,  
Director, Green Chemistry Network,  
University of York*

The challenge for a sustainable society is to provide an increasing number of people with a reasonable quality of life in a way that does not harm the planet. Green Chemistry is now accepted worldwide as the term to describe the development of more environmentally friendly, sustainable chemical products and processes. It can be considered as a set of reductions:

- **Waste** – reducing waste at all stages of the product life cycle
- **Risk and hazard** – making the process and the product safer and less harmful to the environment
- **Materials** – reducing the consumption of raw materials
- **Energy** – reducing the energy demands of all stages of manufacturing and distribution
- **Cost** – through more efficient use of raw materials and reduced waste disposal and pollution charges
- **Non renewables** – moving towards more sustainable manufacturing through greater use of biomass.

Green Chemistry requires fundamental changes in the way we practise chemistry, how we teach chemistry and our attitude towards the use of raw materials and chemical products. The drive towards clean technology in the chemical industry, with an increasing emphasis on the reduction of waste at source, provides unprecedented opportunities for innovation and new technology. Mature chemical processes that are often based on technology developed in the first half of the 20th century, may no longer be acceptable in these environmentally conscious days. ‘Enviro-economics’ and the ‘triple bottom line’ of economic, environmental and social benefit will be the driving forces for new products and processes. The true ‘costs of waste’ are rapidly escalating as a result of new and tougher legislation and a very poor public image which is leading to an alarming reduction in the number of students applying to read chemical subjects at university.

How can we improve the efficiency of a chemical process and reduce its environmental impact? This requires the availability of an ever-growing toolkit of

clean technologies that can be applied individually or more frequently in combination (e.g. through collaboration between chemists and chemical engineers) to green a chemical process. It also requires a different approach to the way that we measure the efficiency of a chemical reaction. Yield and selectivity are commonly employed to define the efficiency of a chemical reaction but these are not especially useful in measuring the amount of waste generated in a chemical manufacturing process.

From an environmental (and increasingly economic) point of view it is more important to know how many atoms of the starting materials are converted to the desired product. Atom economy is one way of measuring the greenness of a chemical process. It can be done theoretically, before any chemistry is done, chemists can evaluate alternative routes.

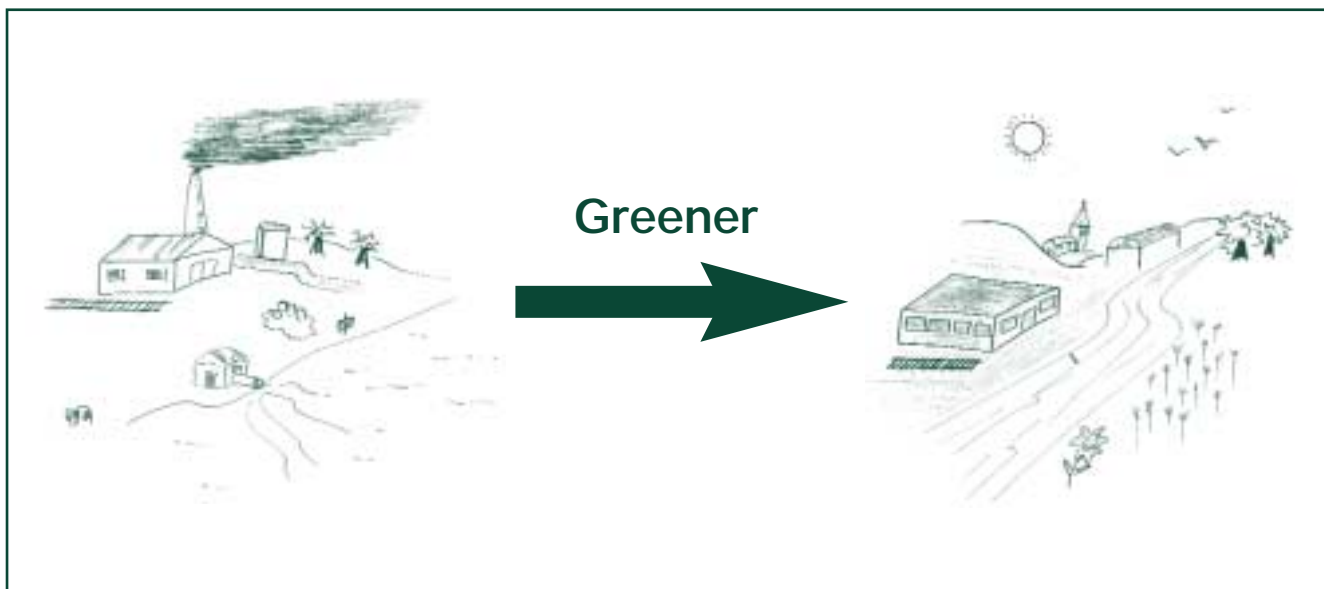
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***As Mahatma Gandhi said: ‘There is enough for everybody’s need in this world but not enough for everybody’s greed.’***

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Many traditional and still widely used chemical reactions have low atom utilisations and this is reflected in the relatively large amounts of waste generated by the higher value end of the manufacturing industries. Waste to product ratios of much greater than 10 are not uncommon!

Green Chemistry teaches us to consider all stages in the life cycle of a product from mining raw materials through processing, use and disposal. The fate of a product including factors such as recyclability, biodegradability and product leasing should be considered at the initial product design stage – ‘benign by design’.



What will a chemical manufacturing company look like in the future? The dirty and threatening skyscraper-sized industry of the past will no longer be acceptable. Excessive storage and transport of hazardous material will also be increasingly avoided. The future manufacturing company should be:

- Small and flexible, designed to manufacture exactly what is required when it is required
- Giving zero emissions, recycling 'unused atoms' and producing only biodegradable waste
- Making full use of local resources including energy sources (solar, water, wind, etc), crops as raw materials, clays as catalysts, etc
- Producing safe, long lifetime products that at the end

of their lifetime are either returned to the supplier or are biodegradable.

These are challenging but also exciting days for chemistry and chemical manufacturing. The industry has to respond to the more complex demands of society.

To achieve this we must influence all aspects of the subject – education, research and application. There are almost unlimited opportunities to exploit new technologies and to provide a reasonable quality of life for the world's population while not threatening its future.

As Mahatma Gandhi said: 'There is enough for everybody's need in this world but not enough for everybody's greed.'



## Frameworks for an integrated global climate management strategy

*Dr Mike Hulme,  
Executive Director,  
Tyndall Centre for Climate Change Research*

The newly found, but unwanted, ability to alter the climate of our planet, presents human society with a profound challenge. As a species we are substantially adapted to our ambient climate(s) and we depend intimately upon the resources this climate delivers to us. Changing climate in far-reaching and unpredictable ways introduces a new obstacle for achieving sustainable development and economic growth – although changes in climate may also present new opportunities if these can be grasped.

The scale of this challenge is hard to over-estimate. With prospective global warming of between 1.4° and 5.8°C over the coming century – a three-to-twelve fold increase in the historical rate of warming observed – we need to take actions that both reduce the size of the problem (mitigation) and allow society to cope sustainably with whatever residual change in climate will inevitably occur (adaptation). To design and implement

these actions we need an overall global climate management strategy that recognises:

- Mitigation and adaptation policies need designing in parallel; they are not alternatives and need to be tackled simultaneously identifying appropriate synergies between the respective measures. For example, our future buildings need designing both for a warmer climate and to be less carbon intensive.
- The global nature of the challenge. For example, we need a (near) comprehensive international framework, such as the Kyoto Protocol, in order to make meaningful collective progress.
- There are widely differing stakeholder interests and values both within and between societies. For example, we can show that individual citizens fall into a typology of 'believers', 'doubters', 'engagers' and 'disengagers', these differing psychologies influencing the way in which policy measures are per-

ceived and accepted.

What frameworks exist within which such a strategy might be developed and operationalised? Let me mention three over-arching frameworks that have been suggested, one of which has been predominant to date (precaution), one of which I would argue is unattainable (optimisation), and one of which needs future development and input from science and society (risk assessment).

■ **The precautionary principle.** This underlies the UNFCCC and its objective of stabilising concentrations of greenhouse gases at a level that avoids dangerous climate change. The definition of 'dangerous' is deliberately impossible to make operational, and so we end up with an emissions reduction target approach which repeatedly cites carbon dioxide stabilisation at 550 ppm (roughly equivalent to a 60 per cent reduction in emissions) as the 'gold standard' of successful climate management. Not only is there no agreement on what constitutes 'dangerous' climate change, however, there is little formal role in this framework for accommodating social adaptation process.

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*'We need to identify, inter alia, critical thresholds in natural and social systems, to estimate their probabilities, to understand the psychology of risk...'*

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■ **An optimised benefit/cost analysis.** This is an approach recently espoused by the Danish statistician and author of *The Sceptical Environmentalist*, Bjorn Lomborg. He argues that we should not take any deliberate climate policy measures until, and unless, justified by a formal, and presumably global, benefit/cost analysis that demonstrates in monetary terms the economic imperative of policy intervention. This approach has been widely discredited, yet it remains an often implicit intellectual pillar for those opposed to the current Kyoto policy regime. It places massive, and in my view unattainable, demands on the scientific, social and economic knowledge base.

■ **A risk assessment framework.** This seems to me to offer the prospect of progressing beyond a rather flabby, and unquantified, application of the precautionary principle which can be used to support almost any climate policy depending on the predilection of the proposer, and yet does not require us to go so far as to pretend we can apply classical benefit/cost analyses to the problem of global climate change. In this approach, we need to identify, *inter alia*, critical thresholds in natural and social systems, to estimate their probabilities, to understand the psychology of risk held by different communities and cultures, and allow politicians to work with this raw material to lead societies in a direction in which climate change policies are acceptably balanced

against the long-term objectives and aspirations of its citizens. This framework also places demands on the scientific and social knowledge base, but in my view entirely reasonable and attainable ones. I illustrate this with the example of possible rapid climate change in the North Atlantic basin as a result of a potential Gulf Stream collapse, the subject of a new £20m research investment by the Natural Environment Research Council.


Finally, let me mention some specific research questions that the Tyndall Centre are committed to tackling and which, I suggest, will contribute to the development of such a risk assessment framework. These questions will be researched by drawing upon the centre's unique capacity for trans-disciplinary research created through its multi-site infrastructure:

- How do we realise a 60 per cent carbon emissions reduction in the UK? Technically we know this is achievable, but what social, economic and regulatory pathways will eventually deliver such an ambition?
- How do we develop a common basis for risk assessment for balancing different policy options? For example, how do we judge the relative risks associated with rapid climate change, with an expansion of nuclear energy, or with adopting a carbon accounting framework for land use allocations?
- How do we design climate change into our regulatory, design and planning infrastructure? Can we develop probabilistic descriptions of future climate that can be used in economic management and engineering design?
- How do we achieve global emissions targets recognising the legitimate development aspirations of nations, and the moral imperatives of equity and social justice?

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*'How do we judge the relative risks associated with rapid climate change, with an expansion of nuclear energy, or with adopting a carbon accounting framework for land use allocations?'*

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These are some of the areas in which the Tyndall Centre – as established by the three UK research councils NERC, EPSRC and ESRC, together with support from the DTI – is working here in the UK and, through appropriate partnerships, in Europe. 

■ *The above four articles are based on papers presented at a seminar of the House of Commons Science and Technology Committee and the Parliamentary and Scientific Committee on the 14th March 2002 as part of Science Week. Versions of these papers appeared originally in Science in Parliament Vol. 59 No.2 and are printed here with the kind permission of the publishers.*

## London to ban polluting motor vehicles

Half a century after the great London smog of 1952 caused 2,000 deaths (and eventually led to the 1956 Clean Air Acts), the Mayor of London, Ken Livingstone, has published an Air Quality Strategy for the capital which embraces the concept of a Low Emission Zone intended to ban highly polluting lorries, vans, buses and taxis from the whole of Greater London.

The strategy is intended to cut the 1,600 premature deaths caused every year in London by air pollution, chiefly particulates and nitrous oxides from motor vehicle emissions. The new zone would ban vehicles that failed to meet stringent new European standards.

Paradoxically, the final strategy is unlikely to embrace highly-polluting cars, since such a move would be too expensive and would hit the poor hardest as they own the oldest vehicles.

But the strategy includes research findings claiming that 66 per cent of Londoners believe pollution affects their quality of life. The Low Emission Zone (LEZ) would be introduced in the spring of 2006. Such zones have been pioneered in Sweden, but the London LEZ would be the first of its kind in Britain. Mr Livingstone declared that, 50 years after the first legislation to tackle London's smogs, radical action was needed to prevent similar problems.

## High flood insurance at risk

The Association of British Insurers (ABI) was expected to announce its plans for Britain's two million homes in flood risk areas, with some companies ending cover for some vulnerable homes and raising rates considerably for others. Following the serious floods of 2000, for which insurers paid out £1bn in claims, the ABI announced a two-year moratorium, now drawing to a close, on any withdrawal of cover in the worst-hit areas. Some firms are expected to claim that the Government has failed to build better flood defences in the interim.

The DEFRA minister, Elliot Morley has tried to forestall this by arguing that £150m of extra funding had been agreed upon in this year's spending review, with 279 repair and improvement schemes having been approved in the past two years in England and Wales. Mr Morley claimed that every area affected by the 2000 floods now had repaired defences and, in many areas, new, improved defences were being built and planned. Planning guidance had been strengthened

to minimise building on flood plains and now only a small percentage of planning permissions ignored Environment Agency advice. The new investment was being put in as quickly as the construction industry could allow, he added. The Institution of Civil Engineers had estimated that the latest three-year programme would generate work for an additional 300 civil engineers.

In the meantime, a new £2m publicity campaign, fronted by the broadcaster John Peel, was launched in September by the Environment Agency to warn the public to be aware of flood risk. In addition to the extra £150m announced this year for defences, some £106m was being spent on flood warning systems, including new schemes to alert those at risk via their mobile phones as well as home phone numbers.

However, some insurance advisers are telling homeowners in high-risk areas to stay with their current insurers even if premiums rise, in case they are unable to obtain cover from another company.

## Britain in Bloom: saviour or disaster for the environment?

Accused of turning Britain's once green and pleasant land into a chocolate-box world of technicolour borders and sweet-smelling hanging baskets guarded by a tyrannical army of bad taste gardeners, Britain in Bloom, in which 1,400 communities participate, has received more than its usual level of publicity this year.

Several critical attacks on its nature and purpose have been countered by a robust defence from the horticultural community, including an hour-long dedicated television programme fronted by Alan Titchmarsh. This has followed the Royal Horticultural Society's (RHS) assuming custodianship of the competition.

Eminent gardener and historian Sir Roy Strong has led the criticism, accusing the competition of 'spreading flowers like disease'.

'Petunias and begonias are put on with a spray gun,' he says, 'and the results are that the countryside is prettified, Disneyfied... they apply flowers like lipstick to the Mona Lisa. They are a kind of prosthetic. I have seen villages where you almost expect to see Snow White and the Seven Dwarfs fall out of the door, all too chocolate box, too cloying for words.'

He has argued that Britain in Bloom ignored a year-round, seasonal approach to gardening and its wider environmental setting, including Britain's once proud Victorian tradition of urban parkland and municipal gardens.

Ironically, however, the RHS's involvement appears to have emphasised just those very qualities this year. Defenders claim that the competition has become strongly influenced by post-Rio concerns. Judges now allocate only 30 per cent of total points to floral displays. Permanent landscaping accounts for 25 per cent of marks, environmental quality 20 per cent, Agenda 21 and sustainable development 15 per cent, and public awareness 10 per cent.

How far the Johannesburg summit influences UK horticulture remains to be seen. In the meantime, the UK spends £3bn annually on home gardening.

are you doing your bit?



# National Parks 'at the heart of sustainable development'

According to Rural Affairs Minister Alun Michael, National Parks are at the heart of the Government's strategy for sustainable development. As part of a keynote speech delivered to the National Park Authorities Conference in Hexham four days before the countryside march on London, he argued that National Parks will be 'test-beds for sustainable development'.

'They are national assets identified because they are, with Areas of Outstanding Natural Beauty (AONB), our most beautiful and precious landscapes and ones which are especially desirable to conserve and enhance for us to understand and enjoy... The Association of National Parks Authorities suggested that we should see National Parks as exemplars of Rural Revival, and I believe we can go even further. As test-beds for sustainable development, they can show the way forward for all rural areas, whose well-being is central to DEFRA's priorities.

'That is why I recently brought Regional Development Agencies and local government representatives together with representatives of National Parks and AONBs to develop a strategy for the future. In each region of England, these partners will set out their joint plans for joint action and I will publish these as a consolidated document by the end of the year. I am confident the result will be bigger than the sum of the parts.

'For the first time we have a rural Public Service Agreement. This will set challenging targets for improving service delivery and ties the performance of rural economies to the national economy. We have a new Rural Service Standard, and are working with the Countryside Agency to ensure that all areas of

Government policy consider the needs of those living and working in rural areas.

'National Parks are at the heart of our agenda for rural success. The National Park Review reflects the growing role of National Parks – it is a sensible, practical blueprint as we take the National Parks of England into the 21st century.'

As well as seven National Parks in England there are three in Wales designated under the National Parks and Access to the Countryside Act 1949. In Scotland, under separate legislation, Loch Lomond and the Trossachs became part of the family in July 2002 and will be followed shortly by the Cairngorms.

The public service agreement referred to reflects the August publication of rural services standard 2002, setting out the level of access to services that people living in rural areas should expect for the coming year. It is meant to show how the Government departments and agencies are working in partnership with local organisations to tackle social exclusion in rural areas and improve access to services. As such it embraces such issues as presumption against closure, for example, rural schools; indicators on access level, for example transport; geographical access standards, for example location and opening hours of libraries; response time targets, for example emergency services; telephone services, for example on line information on child care providers; and help with fares, for example claiming travel costs for attending benefit offices.

Chairman of the Countryside Agency Ewen Cameron indicated that the Rural Services Standard First Progress Report 2001-02 had established a baseline for measuring progress. It revealed a need to do more to refine the standard, so that ser-

vice delivery could be more accurately measured. There was a need to ensure that all departments understood exactly what information was required and to make arrangements to collect it in a consistent manner. In a flight of some semantic fancy, this was being addressed through work by the Countryside Agency and DEFRA to 'rural-proof Government policy'. For example, the Countryside Agency was now developing a childcare indicator and monitoring population distances from GPs and dentists. This will give a fuller picture of how rural services are delivered. Over the next year it will also investigate the scope for a common rural standard for police forces and monitor the rural take up of the funding for UK Online.

Copies of the Rural services standard 2002 are available from DEFRA Publications on 08459 556000 and *Rural Services Standard, First Progress Report 2001-02* is available from Countryside Agency Publications on 0870 120 6466. Both publications can be downloaded from the DEFRA website at [www.defra.gov.uk/wildlife-countryside/ruralwp/index.htm](http://www.defra.gov.uk/wildlife-countryside/ruralwp/index.htm) or the Countryside Agency website at [www.countryside.gov.uk/publications/publication.asp?PublicationID=553](http://www.countryside.gov.uk/publications/publication.asp?PublicationID=553).

The first rural services standard was published in the Rural White Paper in November 2000 (Cm4909). The Countryside Agency's Progress Report covers the period 2001 to 2002. The first rural proofing annual report was published in April (available on the Countryside Agency website, [www.countryside.gov.uk/publications/publication.asp?PublicationID=517](http://www.countryside.gov.uk/publications/publication.asp?PublicationID=517)) and a revised rural checklist would be published in September.

## Sewage sludge regulations to be improved

Improvements to the sewage sludge treatment regulations to encourage the recycling of the sludge to agricultural land and to improve enforcement and monitoring by the Environment Agency have been announced by Water Minister Elliot Morley.

The proposed revisions to the regulations will:

- strengthen the requirements for sludge treatment processes to ensure that potential pathogens, such as E.coli O157 and Salmonella, are not transmitted into the food chain;
- introduce more stringent post application controls on harvesting and grazing;
- ban the use of untreated sludge on

agricultural land on which food crops are grown, which was banned voluntarily from the end of 1999.

Mr Morley said the measures were reflected in the 'Safe Sludge Matrix', a voluntary agreement between Water UK and the British Retail Consortium, but the revised regulations will make the voluntary standards a statutory requirement.

# Uncertain future for UK Coal

British Coal, privatised under the last Tory government, beset by technical problems and falling prices for its core product, reported increased losses in September, despite earlier promises that it would break even by the end of the year. The company lost £12.5m before tax in the first six months of 2002, compared to £10.8m in the previous year.

UK Coal was privatised out of what was left of Britain's mining industry in 1994. It operates 12 deep mines in the UK and a number of surface mines. Under its previous chief executive, Richard Budge, who left in acrimonious circumstances last year, it made healthy profits in the years after its float. But since then, cheap imports have increased and the mines have been run down, making it more expensive to recover their remaining coal.

Last year, UK Coal received £75m

as part of a government aid package. But the government has made clear the industry should not expect further handouts.

The company has not been helped by geological problems at its Daw Mill colliery in the Midlands, cutting production at the mine tenfold from 50,000 down to 5,000 tonnes a week. The company is also undergoing a costly closure programme. In August, the Prince of Wales colliery closed, taking £13m to meet redundancy costs. The company, which employs about 8,000, says it will close its Selby, Yorkshire, pit in 2004, resulting in a second-half charge of £40m, with government contributing £10m to the costs.

Falling domestic gas prices have encouraged power station operators to use gas instead of coal. International coal prices have also slipped, with the

price per tonne falling from \$34 at the start of the year to under \$26 in August, a three-year low. Prices are expected to recover but that may not be enough to allow the company to break even in 2003 in order to guarantee its future in the medium to long-term.

The cost-cutting programme 'Project 105' aims to reduce costs by more than 20 per cent over the next 18 months, and the company is nearly halfway to achieving this. But it faces foreign competition from companies which can pay their workers lower wages, under worse working conditions, and produce coal more cheaply as a result.

Since most of the company's property and land is tied up in the loss-making business of producing coal, further closures to turn the land over to more profitable uses look likely.

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## Scottish timber switching from road to sea

A project to shift more timber by sea from the forests of Argyll to Ayrshire looks to be bearing fruit with new figures showing that 120,000 tonnes of wood have been moved since 2,000 via the port at Ardrishaig.

As a result of the west Scottish scheme, called the Timberlink project, British Waterways estimates that around one million lorry miles have been removed from the trunk road network between the two regions. This is in line with the Scottish Executive's plans to remove 18 million lorry miles from Scotland's roads annually from this year. Indeed, in February 2000, the Executive awarded a freight facilities grant of £4.4m to help Associated British Ports (ABP) develop the timber shipping service.

The Scottish forest industry's output is valued at £800m a year, representing 0.5 per cent of GDP. It employs more than 10,000 workers. Scotland's timber harvest is set to double over the next 15 years as forests planted in the 1960s and 1970s mature, and the Executive is keen to reduce the number of lorries transporting timber on public roads. The Argyll region is one of the leading areas for the growing and harvesting of timber. Much of the wood is used at paper mills to the south such as the Caledonian Paper plant in

Irvine, Ayrshire. Previously, the wood was taken by road, a tortuous journey of 150 miles taking several hours. Under the Timberlink scheme, the wood is transported from the forests to the port at Ardrishaig by road and then south by sea, sometimes via Campbeltown, to Ayr and onto the buyer. One shipload is equivalent to 40 to 50 lorry loads. The scheme reflects the successful redevelopment of the port at the Ardrishaig end of the Crinan Canal, owned by British Waterways, where £300,000 has been spent upgrading facilities since 1995.

The shipping firm, Taylor & Taylor, has taken advantage of the initiative and now transports the bulk of the timber from Argyll to Ayrshire. A gap in the market was identified two and a half years ago to move more timber by sea rather than by road. As a result, the firm purchased a 65 metre-long, 1,400-tonne ship called the Red Baroness to operate on the route. The ship carries up to 1,200 tonnes once or twice weekly.

Around five million tonnes of timber are produced in Scottish forests every year and this figure is rising with the wood used for construction, fencing, pallets, wood-based panels and pulp and paper. Domestic consumption is about one tonne per person per year, making Scotland almost self-sufficient in timber

in tonnage terms. But this is set to change. Sitka spruce is the most commonly found tree in Scotland's new forests and takes about 40 to 45 years to reach economic maturity. New forests of trees planted since 1960 will be harvested in the first 15-20 years of the 21st century, meaning production is set to double to around 10 million tonnes between 2015 and 2020. When this occurs, Scotland's role will be as a major exporter of timber to the rest of the UK.

Concerns have been raised about the potential impact on the environment, traffic congestion and rural communities. Many of Britain's minor public roads, which started life as farm tracks coated with a thin covering of bitumen and chips, were not designed to cope with timber lorries weighing up to 41 tonnes. In response to the expected huge growth in volumes, timber transport groups have been formed in several parts of Scotland to bring together the forest industries, hauliers, local authorities, the Forestry Commission and Scottish Executive.

The Executive has doubled the resources available for freight facilities grants during the 2001-04 period to £36m. Scottish councils have also been awarded £70m in the three-year period to tackle the backlog of repairs to local roads and bridges.

# UK Global Diversity programme

In the wake of a disappointing Johannesburg Earth Summit, the UK Prime Minister personally associated himself with the announcement in September that the Darwin Initiative – which supports bio-diversity projects around the world and which was launched at Rio – will receive an extra £7m of government funding during the next three years.

The current £3m annual budget will be boosted by £1m next year, £2m the following year, and £4m in 2005. Projects are selected which would not take place without this funding and which will continue to benefit the region after the UK

contribution, which typically runs for three years, has been completed. The UK provides not only financial resources, but also skills and expertise. Darwin projects have focused on countries that have faced major problems of species and habitat loss – half have been Asia and Africa, and several have been established in South America and eastern Europe. They range from a penguin-monitoring project off Cape Town, South Africa, to a snail survey in Sri Lanka, the conservation of Colombian rainforest and preservation of critically endangered vultures in India.

Between 20 and 35 applications are successful each year from organisations

such as the Natural History Museum, the Royal Geographical Society, the Eden Project, specialist units within university departments, and non-governmental organisations such as WWF.

These organisations work closely with local governmental and non-governmental groups in the host country, and most projects include a substantial training and education element to enable the work to continue after its conclusion. The Darwin Initiative has provided £27m in funding for 270 bio-diversity projects in 100 countries since its inception at the Rio Summit a decade ago. 110 projects are ongoing.

## Ammonia booklet aims to spread the word on pollution

A booklet designed to highlight the widespread environmental damage caused by ammonia emissions has been published by DEFRA.

*Ammonia in the UK* aims to raise awareness of the effects of ammonia emissions and stimulate discussion on what can be done to reduce its impact.

More than 80 per cent of ammonia pollution is produced by agriculture, mainly from livestock manure but also from nitrogen fertilizers. Non-agricultural sources include sewage sludge, landfill

and vehicles fitted with catalytic converters.

The 90-page publication includes maps, photographs and diagrams and will be issued to farming and environmental groups, and others interested in working with DEFRA to tackle ammonia pollution.

It summarises the findings of years of research, covering sources of emissions, monitoring of ammonia in the atmosphere, impacts on the environment and potential techniques to reduce emissions.

Defra has also produced a less technical, eight-page summary of the booklet, *Ammonia in the UK – Key Points*.

Ammonia deposits on plants, soil and water cause widespread environmental problems. Ammonia can also be blown hundreds of kilometres and absorbed into rain, making hills, mountains, and other areas receiving high rainfall, particularly vulnerable.

The effects of ammonia pollution include the spread of grass over areas which were previously mainly heather.

## New atlas of British and Irish flora

Published in September, the widely publicised 910-page *New Atlas of the British and Irish Flora* emphasises how creeping urbanisation and intensive farming have turned once-common flowers into rare species.

The aggressive spread of fast-growing weeds feeding on soil rich in nutrients from farm fertiliser and vehicle pollution has left protected nature sites as the last refuge for some wild plants. Species such as the pennyroyal, the fen orchid, water germander and sharp-leaved pondweed are almost entirely restricted to sites of special scientific interest. Foreign plants that spread from gardens, and the demise of mixed farming, have also assisted changes in the landscape over the 40 years since the last atlas was published. In those decades, changes in farming and forestry practices and an enormous increase in motor vehicle use have exerted profound impacts.

The new atlas contains 750 new

species not listed in the previous volume but shows a decrease in species introduced to Britain in ancient times such as the corn buttercup and the corn marigold.

The atlas records only ten ancient species that have gone since the first recording period in 1930. But there is considerable evidence of flowers disappearing from local areas, with many UK counties losing more than ten species in the same period. The atlas has listings of 1,396 native species that arrived by natural colonisation, such as birch and oak trees and daffodils.

Climate change is considered to be having its first effects on the countryside with Mediterranean plants beginning to prosper in the south of England. Although butterfly numbers appear to have increased because of warmer conditions, flowers take longer to respond and the atlas suggests there has been no dramatic response among British plants.

The study shows a 10km square in

Dorset, including Wareham, is the richest habitat in the UK, with 844 species recorded there since 1970, including 56 rare and scarce species. The atlas, produced from nine million records and with 2,412 maps, is based on work by 1,600 volunteers who visited almost every 10 sq km plot of land in Britain and Ireland. It builds on research from the 1950s in the 1962 *Atlas of the British Flora*. Plants that have increased include recent arrivals, such as the mountain butterfly-bush, native to China, and the American willowherb. Plants in decline include

- the **burnt orchid**, lost from 80 per cent of its 265 habitats: the biggest decline among chalk grassland plants;
- the **corn marigold**: victim of intensive farming on arable fields, mostly in south-east England but also in Scotland;
- the **camomile**: this herb once thrived in acid grasslands but has declined in both Britain and Northern Ireland.



# Consultation process to improve public rights to comment on GM crop releases

Proposed changes to the National List Representations and Hearings system for new varieties of crops, including GM varieties, was opened to public consultation by DEFRA in September.

New varieties of crops cannot be marketed unless the variety has been added to the UK National List or EC Common Catalogue. This requires field trials to show that new crops meet the necessary seeds standards. The National List system has no role in assessing the safety of GM traits. This is carried out under quite separate GM legislation under which GM marketing or Novel Foods authorisations are granted where the trait involved has been assessed as safe for release or marketing.

The new proposals are part of a

package of measures providing improved opportunities for public comment on proposed decisions on the development and approval of GM crops in England. Similar consultations will take place in Scotland, Wales and Northern Ireland.

The revised legislation to implement the new European Directive on the safety of deliberate releases and marketing of GMOs will come into force before Christmas. It will provide statutory rights for the public to comment on proposed GM research trial releases, free of charge, before decisions are taken on whether to grant or refuse authorisation.

These changes will make it possible for safety concerns to be raised at the appropriate point – before decisions

on release or marketing are taken rather than after.

In addition, before decisions can be taken on whether or not to allow a GMO to be released commercially in the EU, the European Commission must hold two separate periods of public consultation. In the UK, the government intends to advertise the fact that such consultations are being held by the Commission, and relevant representations by the public will inform the UK position in making a collective decision in Europe.

This means that it will no longer be necessary for such concerns to be raised under the National List Representations and Hearings system, which was originally designed for seeds issues.

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## Working with the grain of nature: a biodiversity strategy for England

England's new biodiversity strategy *Working with the Grain of Nature* builds on the foundations already laid in conserving habitats and species and aims to go further by ensuring that the implications for biodiversity as a whole are considered as an integral part of other key policies, such as for agriculture, water, woodlands, urban areas and the marine and coastal environment, and in every part of people's lives.

Launching the strategy, Mrs Margaret Beckett, Secretary of State for Environment, Food and Rural Affairs, said: 'Our vision is for a country – its landscapes and water bodies, coasts and seas, towns and cities – where wild species and habitats are part of healthy functioning ecosystems; where we nurture, treasure and enhance our biodiversity, and where biodiversity is a natural consideration of policies and decisions, and in society as a whole.'

'Even if we were satisfied that we had done all we could to protect our most precious sites and rarest species, it would be insufficient to address modern society's pervasive influences on biodiversity. For that, we need fundamental shifts in policy and behaviour, that integrate concern for biodiversity into every aspect

of our lives... in a number of these areas we now have historic opportunities to make real changes for the better.'

The strategy sets out objectives and policies and a five year programme of action for five important policy sectors, working more closely with the grain of nature rather than against it:

- In **agriculture**, it encourages the management of farming and agricultural land so as to conserve and enhance biodiversity as part of the Government's sustainable food and farming strategy;
- In **water**, it aims for a whole catchment approach to the wise, sustainable use of water and wetlands;
- In **woodland and forestry**, it seeks the management and extension of woodland so as to promote enhanced biodiversity and quality of life;
- In **marine and coastal management**, the aim is to achieve the sustainable use and management of coasts and seas using natural processes and the ecosystem-based approach;
- In **urban areas** it aims for biodiversity to become a part of the development of policy on sustainable communities, urban green space and the built environment.

The strategy also identifies ways that society as a whole can respond, such as from the business and local communities, and by increasing public understanding of biodiversity and what everyone can do to make a difference.

Mrs Beckett paid tribute to the large number of partners and stakeholders who had made an active contribution to the strategy and who would be essential in helping the Government to deliver it.

'This strategy is a model example of the partnership approach,' she said. 'In putting it together we have created a new model of stakeholder involvement – working from the bottom up. It has been prepared with active participation and contributions from literally hundreds of organisations and individuals inside and outside Government.'

The undertaking to prepare a biodiversity strategy was given in the Rural White Paper, *Our countryside, the future: a fair deal for rural England*, published in November 2000.

- *Working with the grain of nature: a biodiversity strategy for England* is available from DEFRA publications, Admail 6000, London, SW1 2XX and from: [www.defra.gov.uk/wildlife-countryside/ewd/biostrat/index.htm](http://www.defra.gov.uk/wildlife-countryside/ewd/biostrat/index.htm)



# Learning and Teaching Support Network

Subject Centre for Geography, Earth and Environmental Sciences  
(LTSN-GEES)

Update: October 2002

## Introduction

In January 2000, the four UK Higher Education Funding Councils established a Learning and Teaching Support Network (LTSN) consisting of 24 Subject Centres. This major initiative has the aim of promoting and disseminating good practice in discipline-based learning and teaching at tertiary level. The successful bid for LTSN-GEES was submitted by the University of Plymouth in collaboration with the committees of Heads of Departments (Committee of Heads of Environmental Science, Committee of Heads of University Geoscience Departments, Committee of Heads of Geography Departments), the Geological Society and the Royal Geographical Society with the Institute of British Geographers. This unified bid was prepared by senior academics drawn from across the three disciplines and involved careful consultation with the three communities. Interdisciplinary collaboration was a central feature of the bid's preparation and is a continuing hallmark of our work and approach.

## Aims and activities

LTSN-GEES is becoming a major UK and international hub in the exchange of knowledge on learning and teaching across the three disciplines. Its principal aim is to encourage and disseminate good practice. We have a UK-wide brief and this is reflected in the location of our activities and events. The services provided include:

- Conferences
- Departmental workshops
- An enquiry/advisory service (Email: [info@gees.ac.uk](mailto:info@gees.ac.uk)  
Tel: 01752 233 530)
- New lecturers' workshop
- Project funding
- Resource database
- Journals (*Planet*) and newsletters (*LTSN-GEES Digest*)
- Discipline-activities through our three senior advisors:

*Geography:* Prof Mick Healey,  
University of Gloucestershire  
*Earth Science:* Dr Neil Thomas,  
Kingston University  
*Environmental Science:*  
Mrs Jennifer Blumhof, University of  
Hertfordshire

## What can LTSN-GEES do for YOU?

We are committed to providing guidance and assistance for all teaching and learning staff within and across the three disciplines in UK higher education. So if you are looking for new ideas, to enhance student learning, we can offer help in the following kinds of areas:

- Fieldwork
- Labwork
- Special education needs and disability
- Small group teaching
- Work-based learning
- Subject specific skills and key skills
- Integrating C & IT
- Assessment
- Student centred learning
- Graduate employability
- Pedagogic research
- Teaching quality issues

## Highlights

### Events

In April, we held our second swap-shop to support the Earth Science, Environmental Science and Environmental Studies (ES3) Learning and Teaching Guides project. This event was held in Glasgow and attracted an excellent range of examples of practice for us to share. Many of these will be incorporated into the new guides (due out in 2003) as well as being included in our new resource database. For more details see: <http://www.gees.ac.uk/Projects/EESguides.htm>

Our third residential workshop for new and recently appointed lecturers ran successfully in May, at Horton Grange,

University of Birmingham, with around 20 participants. As usual, the participants found it really useful to get together with colleagues from other institutions and share ideas, problems and solutions, and many found it an excellent complement to their own institutionally-based courses for new staff.

We are now about two thirds of the way through our 'Enhancing the quality of fieldwork through pedagogic research' programme and the projects are starting to come up with some encouraging results. In May, we ran a workshop on Qualitative Data Analysis to support those project members who wanted to enhance their research skills. The workshop was very successful and the participants left feeling much more confident in working with qualitative data. A range of individual research publications relating to the programme are now in preparation.

## Projects

In addition to our pedagogic research project, we are also investigating examples of practice in Linking Teaching and Research (<http://www.gees.ac.uk/linktr/linktr.htm>). The project is funded by the LTSN Generic Centre and we are one of five subject centres currently involved. The main aim is to identify, record and disseminate case studies of the way individuals, course teams and departments within geography, earth and environmental sciences enhance the learning of their students by developing the links with their research and to promote ways in which individuals and departments in our subject communities can maximise the benefits for students of these linkages. The project is currently in the case study-gathering phase; these will be published on our web-site and will go towards supporting the development of a workshop.

We have also recently received funding from the Generic Centre to support the development of our Employability

Strategy. This project will be considerably enhanced through synergies with National Teaching Fellowship holders Brian Chalkley (University of Plymouth, Department of Geographical Sciences and Director of LTSN-GEES) and Pauline Kneale (University of Leeds, Department of Geography) who are also working on graduate employability. The initial stages of the project will involve gathering data and resources with a view to developing guides, workshops and other support materials for the disciplines.

LTSN-GEES is involved in one project funded by the LTSN Development Fund tranche 2: Developing Inter and Multi-disciplinary Coverage for Area Studies. This is being led by the LTSN Subject Centre for Languages, Linguistics and Area Studies. We will be involved in promoting the network to relevant members of our disciplines and will be running a workshop for 'GEES Area Studiists' in 2003.

There are currently 11 projects funded through our own Small-Scale Learning and Teaching Projects programme. They are due to complete early in 2003, at which time we will also be advertising our new round of funding.

#### *International liaisons*

Although the great majority of our work is focused on the UK, there is much to be gained from sharing ideas, practice and issues with our colleagues overseas. In July we co-convened a conference at Moscow State University on Education for Sustainability. This conference provided an interesting opportunity for experts in this topic to get together. Papers from this conference, together with other relevant articles, will appear in a special edition of *Planet*.

Also in July, we were invited to a

forum in America to discuss Geoscience Learning Research. This event, sponsored by the National Science Foundation and held at the Johnson Foundation's Wingspread conference centre, involved geoscientists, cognitive scientists, chemists, physicists and biologists who are at the forefront of their field in terms of research on learning.

A formal report of the meeting is to be produced and will be made available on our web-site as well as that of the conference convenors:

([http://www.dlesecommunity.carleton.edu/research\\_education/learning.html](http://www.dlesecommunity.carleton.edu/research_education/learning.html))

#### *Enquiry service*

This service is now up and running and is providing us with many opportunities to seek out new resources. If you would like some information or resources on learning and teaching in geography, earth or environmental sciences, or would like to know more about our activities and services contact us at:

LTSN-GEES, Room 509,  
The Money Centre,  
University of Plymouth,  
Plymouth PL4 8AA  
Tel: 01752 233 530  
Fax: 01752 233 534  
Email: [info@gees.ac.uk](mailto:info@gees.ac.uk)

### *Forthcoming events and activities*

We are currently planning our full programme of events and activities for the 2002-2003 academic year. Here are some examples:

#### **October 2002**

##### **Call for Papers – PLANET Edition 5**

The editorial board of PLANET are now seeking contributions for the next edi-

tion, due to be disseminated in January 2003. The deadline for submissions is Monday October 21st 2002. Information submissions and a guide for contributors can be found at

<http://www.gees.ac.uk/planet/index.htm>

#### **November 2002**

##### **Departmental workshop programme**

Our list of topics for the departmental workshop programme will be advertised in the autumn and departments will be invited to apply for events to run from January to July 2003 (this programme is to be repeated each academic year).

#### **January 2003**

HEFCE Improving Provision for Disabled Students projects due to start. Several bids have been submitted to this fund which have a focus in one or more of the GEES disciplines. We will publicise the successful bids on our web-site as soon as they are announced.

#### **June 2003**

LTSN-GEES two day residential event: 30th June-1st July, The Royal Court Hotel, Coventry

The theme, outline programme (including wine reception and barbecue) and invitation to contribute for this event will be advertised through all the usual channels shortly.

#### *Environmental Science-specific activities:*

For further details of the services offered by our Senior Advisor for Environmental Science, contact:

Mrs Jennifer Blumhof,  
University of Hertfordshire  
Email: [j.r.blumhof@herts.ac.uk](mailto:j.r.blumhof@herts.ac.uk)  
Tel: 01707 284 595

<http://www.herts.ac.uk/natsci/Env/ches/newches/home.htm>

## Book notice

### **Our Common Illiteracy – Education as if the Earth and People Mattered** *by Rolf Jucker*

Frankfurt/M, Berlin, Bruxelles, New York, Oxford, Wien, 2002. 364 pp. Environmental Education, Communication and Sustainability. Edited by Walter Leal Filho. Vol. 10 ISBN 3-631-39117-X; €45.50/£28; paperback; US-ISBN 0-8204-5483-4 *Our Common Illiteracy* takes seriously the international consensus that

Education for Sustainability (EfS) is crucial to the survival of humankind. It establishes the principles of a sustainable society and performs a rigorous assessment of the reasons for our unsustainable present. Only on that foundation, it is argued, can the role of education in the transition to a sustainable society be meaningfully assessed. Such an approach is by necessity complex, transdisciplinary and broad. It has to acknowledge the limited significance of education within

contemporary society, along with other 'educators' such as the media, the economy and the shadow curriculum of institutional practice. The book ends with 28 practical strategies to foster Education for Sustainability.

Contents: Sustainability as intention and Paradigm, The Pathology of Denial, Our Unsustainable Present, Education for the Future, Education for Sustainability (EfS), and 28 practical strategies to foster EfS.

### 1. Society for the Environment

The newly established Society for the Environment (formerly known as CUBE) held a formal public launch at Environment 2002 at Stoneleigh Hall on the morning of 23 October 2002. The event was hosted by the Environment Agency, the organisers of Environment 2002, and the launch address given by Barbara Young, their Chief Executive. The Institution representatives were Will Pope, Stephen Martin and myself. Will is currently Chairman of the Steering Group of the Society and I am Secretary.

### 2. PP4SD

After a slow start, Phase 2 of the project is expecting to make more significant progress over the next six months. The Foundation



Course produced in Phase 1 is being developed for use in the training of graduate employees of a major financial institution. A workshop for the participating professional institutions is taking place during October to develop the Phase 2 programme targets. A report of the outcome is anticipated in the next issue of the Journal.

### 3. John Connell Memorial Award

The John Connell Memorial Award, jointly sponsored by

the Institution, Casella and the Noise Abatement Society, will be awarded for the first time this year. Entries from graduates closed on 1 October and judging will be carried out during October. It is expected that the winner will be announced in November.

### 4. London office

With the kind assistance of our President, the Duke of Westminster, arrangements have been made with Grosvenor Estates for the use of office and meeting facilities

at 38 Ebury Street in Victoria. This now provides the Institution with a more established point of reference in the capital.

### 5. Responses

Responses have been submitted to the following consultation documents:

- Sustainable Food and Farming: Working Together (DEFRA)
- Policy Commission: Consultation on the New Priorities Board (DEFRA)
- Environmental Effects of Marine Fisheries (RCEP)

### 6. IAQM Launch

There will be a launch of the new Air Quality Management group on 14 November 2002 at the CIEH headquarters in London. There will be an evening reception and an address by Martin Williams.

**RAF**

## New members

The IES is pleased to welcome the following to membership of the Institution:

|                   |                                    |
|-------------------|------------------------------------|
| Miss A. Chaney    | Student, University of Greenwich   |
| Ms W. Chu         | Principal Environmental Consultant |
|                   | Green Technology Consultants Ltd   |
| Miss A. L. Garden | Area Hydrogeologist,               |
|                   | SEPA                               |
| Mr R. Harwood     | Exploration Geologist,             |
|                   | Bastillion Limited.                |

|                    |                                    |
|--------------------|------------------------------------|
| Miss L. Pediatiti  | Postgraduate Student,              |
|                    | Oxford Brookes University          |
| Mr R. J. Pritchard | Area Hydrogeologist, SEPA          |
| Mrs A. K. Reilly   | Environmental and Hygiene          |
|                    | Systems Officer,                   |
|                    | Sanmex International Ltd           |
| Miss S. J. Stroud  | Engineer, Card Geotechnics Limited |

## New web site and e-mail addresses

The IES has new e-mail and web site addresses:

- ◆ **e-mail:**  
[ies-uk@breathemail.net](mailto:ies-uk@breathemail.net)
- ◆ **web site:**  
<http://www.ies-uk.org>

## Moving? Changing jobs?

**Remember to let us know promptly with your new address, telephone number, etc. This can avoid loss of communication, wasted postage and unnecessary complications.**

**Write to: IES, PO Box 16  
Bourne, PE10 9FB**

**Tel/Fax: 01778 394846**

**E-mail:  
[ies-uk@breathemail.net](mailto:ies-uk@breathemail.net)**

### Diary dates for 2002

|       |                     |       |
|-------|---------------------|-------|
| 6 Nov | GP Committee        | 10.30 |
| 6 Nov | Council             | 13.30 |
| 6 Nov | Education Committee | 15.00 |

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