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FEATURE ARTICLES

Conservation issues in the coastal zone – a case study

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Introduction

The Welsh coastline is an important natural resource with a large proportion designated for its high conservation value. In February 1999, the first Wales Coastal Forum Conference identified key pressures in the coastal zone including tidal flooding, development pressures, pollution, fisheries, dredging, recreation and tourism. According to Pattinson (1999), these pressures, coupled with the need to preserve a high conservation value, make it important that coastal zone management is embraced within the overall sustainable development strategy for Wales

With the Pembrokeshire Coast National Park to the west and the Glamorgan Heritage Coast to the east, Gower is what many people consider the jewel in the crown of the South Wales coastline. Its location and the limits of Swansea Bay are illustrated in Figure 1.

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Gower's coastal environment includes sandy bays, cliffs, dune systems and salt-marshes and in 1956, it became the first designated Area of Outstanding Natural Beauty (AONB). Conservation pressures are becoming increasingly significant and the promotion of sustainable use, resolution of conflict and strategic planning are seen as essential.

Recreation and Tourism

Pattinson (1999) suggested that coastal recreation and tourism is more important in Wales than the rest of the UK. In Wales, 95,000 people are employed in tourism and this represents 9 per cent of all full-time employment (Stevens, 1996). It contributes £1.3 billion to the Welsh economy without any subsidies and it is predicted that by 2005 the number of tourists will double. As employment in agriculture and traditional industries declines, tourism will become an increasingly important economic aspect, especially for National Parks and AONBs.

As the environment is now being regarded as part of the capital of tourism, so investment in environmental improvement will lead to a greater return on tourism. Hall and Boyne (1999) argued that natural environmental factors – microclimate, flora, fauna and hydrology and of course relief, have often been selectively promoted in terms of exoticism and uniqueness. This has been particularly notable in the UK's more peripheral holiday regions in Devon and Cornwall, Wales, Northern Ireland and Scotland. They further argued that transport and tourism are two of the most dynamic and critical factors having substantial environmental impacts, which raises the paradox of tourism. Unrestrained it can destroy the very attraction and attractiveness of the natural and human environ-

Figure 1: Location map (Source: Simmons et al (1993))

ment that underpin it. Problems of access and congestion are stimulating ever changing opportunities for land use conflict and the spoiling of the natural environment.

Conversely, there are those who would argue that a strong local economy, to which tourism could be a major contributor, helps secure a healthy natural environment. Certainly the two are fully compatible with the principle of sustainable development as follows:

> 'Sustainable development does not mean having less economic development: on the contrary, a healthy economy is better able to generate the resources to meet people's needs and investment and environmental improvement often go hand in hand. Nor does it mean that every aspect of the present environment should be preserved at all costs. What it requires is that decisions throughout society are taken with proper regard to their environmental impact.'
>
> *(Sustainable Development: The UK Strategy 1994)*

The consequences of tourism on conservation in Gower could be significant. The 1996 winter and summer populations in Overton and Port Eynon were 472 and 4,887 respectively (Source: Acer Environmental, 1996). Unlike many other peripheral environments, Gower is easily accessible by car and although a transport policy is being formulated, the Government will not want to be seen as removing the personal freedom of the motorist. On many occasions all car parks in Gower have been full with more motorists attempting to reach the beaches. Compounding this problem, some drivers thoughtlessly park on any available piece of land or in any gap in the hedgeline in a manner more befitting abandonment than parking.

Unfortunately the irresponsibility of some tourists does not end with parking. At Oxwich, visitors have frequently destroyed fences for beach barbecues and similar incidents have occurred on the Glamorgan Heritage Coast. The solution to these problems at present is

Table 1: T99 Values

Type	Conditions		
	HARSH *(sunny, warm clear seawater)*	**MODERATE** *(deeper water, cool dull weather)*	**PROTECTED** *(associated with suspended or settled sediment)*
Coliforms	1 – few hours	Hours – days	A few days
E.coli	Hours – 1 day	A few days	Days – weeks
Faecal streptococci	1 – a few days	Days – 1 week	Weeks
Human pathogenic viruses	A few days	Days – weeks	Weeks – months

(Source: Fourth Report: Pollution of Beaches. Volume 1. House of Commons Environment Committee 1990)

unclear but a transport policy would undoubtedly help.

Sewage

Until recently, sewage and sewage derived litter had been a problem for the bathing waters and beaches of Gower. Simmons *et al* (1993) reported that 34 discharges between Worms Head and Nash Point, including the Mumbles Outfall, consisted predominantly of domestic sewage, and 31 of these discharged without any form of treatment. It was further reported that the results of a litter sampling survey in the waters around the White Oyster Ledge area of Swansea Bay, included 887 items of sewage related litter, 24 per cent of the total sample. In addition, North Gower is exposed to discharges into the Loughor Estuary from both Gowerton and Llanelli Sewage Treatment Works. This has implications for public health as illustrated by Table 1, which shows the time taken for 99 per cent of microbes to die when discharged into controlled waters:

It can be seen that the sea around Gower represents a moderate to protected environment for these microbes. In 1996, the Green Seas Initiative was launched aiming to achieve up to 50 European Blue Flag beaches in Wales including Rhossili, Port Eynon, Oxwich Bay, Caswell Bay, Langland Bay, Limeslade Bay and Bracelet Bay, by the Year 2000. To achieve this status, bathing water must comply with the Guideline value of the appropriate microbiological parameters of the European Bathing Water Directive 76/160/EC. Amongst other conditions, no industrial or sewage discharges or gross pollution by sewage related or other litter is allowed on the beach or intertidal area. Since 1996, new state of the art wastewater treatment plants have been brought on line in Swansea and Llanelli. They include tertiary treatment via Ultra-Violet (UV) light disinfection, which is effective against bacteria and viruses and thus critical to the achievement of European Blue Flag beach status. Welsh Water is also upgrading current sewage treatment facilities for the Overton and Port Eynon areas. England (1999) found no evidence of sewage derived litter in a recent beach survey at Pwlldu Bay which, along with anecdotal evidence of cleaner coastal waters, suggests that the new works are having an immediate effect in the coastal zone.

However, in many estuaries and coastal waters, natural sources of organic matter from soil have diminished because of land-use changes. Sewage is about the only source left and when that goes, wildlife suffers. Herein lies the irony as Pearce (1998) stated:

> 'The water companies that have the task of keeping the sea clean are working so hard to provide pristine bathing waters for tourists that marine worms are going hungry and birds are taking off to more nutritious shores. We need more seaweed on the beach and more sewage in the water.'

There is also concern as to whether massive spending on keeping sewage out of the sea is causing a decline in overall British bird populations. According to Pearce (1998), there is concern that the new works at Llanelli has removed a food source for the cockles in the Burry Inlet. This is one of the world's most important habitats for commercial cockles and any decline in the numbers of this grazing population will have an economic impact on a traditional Gower industry.

Litter

Along the strandline of a beach, amongst the seaweed and driftwood, various forms of litter including cans, plastic bottles, fishing lines, and wrappers can be observed. As well as its potential danger, it is also aesthetically displeasing. Although as the number of beach users increases, so does the amount of litter such as cans, snack food wrappers and cigarette ends, research has shown that this is negligible in comparison with

Plate 1: Pwlldu Bay

overall quantities of beach litter. In their work on the Glamorgan Heritage Coast, Simmons and Williams (1992) found that plastics, metals and paper numerically made up approximately 75 per cent, 20 per cent and 5 per cent of the litter and concluded that there was negligible seasonal variation. This agreed with results from other study areas in England and Scotland and suggests that tourism is not a major cause of beach litter. This is further supported by the results of a 1998 beach clean up at Rhossili, which produced 102 black bags of rubbish. As the beach is generally sparsely populated even in the warmest weather, it is reasonable to conclude that beach users were not responsible for this litter.

Other inputs of marine litter include ships, industrial and residential sources via rivers and the municipal sewer drainage schemes discussed previously. The Swansea Bay area is a busy merchant shipping, commercial fishing and pleasure boating region and it is likely that this is a considerable source of litter. England (1999) investigated marine litter on the beach in Pwlldu Bay, shown in Plate 1. Public access to the bay is difficult and surveys were undertaken during the early months of the year to eliminate as much as possible any impact from beach goers. Results showed that plastics accounted for 88 per cent of the litter composition and included a sweet wrapper originating from New South Wales.

As well as the aesthetic problem, plastics are persistent in the environment and also pose a threat to wildlife. According to Laist (1987) marine and terrestrial mammals, birds, sea turtles, fish and crustaceans are particularly susceptible to death or injury from discarded plastic. There is adequate legislation to protect the coastline but its enforcement is ineffective.

The strandline however, is a unique habitat, which is neither terrestrial nor marine. It is home to a variety of invertebrates which, in turn, support local bird populations. Many local authorities mechanically rake and clean their beaches for the benefit of tourists and this often results in the entire strandline being ripped away. Strandline detritus and seaweed is seen as vital to keeping the sand moist and bound for colonising plants. At Port Eynon, where the beach is mechanically cleaned, Pearce (1998) reported that a layer of clay is gradually being exposed beneath the base of the dunes behind the beach. Similar findings have been reported in Scotland and it appears that strandline clearance not only impoverishes wildlife but also contributes to dune erosion. The South Wales Evening Post (20/1/99) reported that the mechanical ploughing and cleaning of Swansea beach was a possible cause of the sand drifts on Mumbles and Oystermouth Roads. Unfortunately, it appears that ecological friendliness and cleanliness may be incompatible as European law requires governments to protect natural habitats and make beaches clean and suitable for humans. Beaches are recreational areas with Gower beaches a showcase. As argued by Simmons *et al* (1993), litter is not acceptable and tide washed litter is even less so.

Erosion

Erosion of popular beaches including Oxwich has been giving concern for some years. However, in 1911 the Royal Commission on Coast Erosion and Afforestation which led to Parliamentary acts in 1913 concluded: '…Beaches are formed from the erosion of land… therefore a certain amount of erosion must take place.'

Although the Gower Peninsula is predominantly

Plate 2: Knab Rock development and beach formation

Carboniferous Limestone and is generally resistant to erosion, there are a number of beaches that overlie rock platforms and are subject to change. Some beaches are naturally volatile being exposed to the southwest and, as such, the worst of the storm surges.

Natural processes of sediment movement cause erosion and accretion along the coastline in a complex and sometimes unpredictable manner. Bullen (1993) stated that the main ebb tidal current carries material down channel and this is distributed along Gower beaches and onto the Helwick Bank. It is estimated that the Severn Estuary carries over 30 million tonnes of suspended sediment on a spring tide (SES, 1997). Understanding of the sediment transport processes in Swansea Bay and its net anticlockwise movement led Moran (1981) to predict the formation of a beach on the southern side of the Knab Rock development in Mumbles (Plate 2). This development, the first reinforced earth construction, altered the existing coastline profile by protruding into the Bay and provided much needed parking facilities for tourists.

Dredging

The extraction of sand from the Severn Estuary and Bristol Channel has for a century been vital to the construction industry and economy in South Wales and South West England. The Second Severn Crossing, the National Stadium and the Cardiff Bay Development are all examples where marine sand has been used. Almost 90 per cent of the sand supplied in South Wales comes from marine sources (Bellamy, 1999). This is because the marine sand is of an extremely high quality and there is a lack of viable alternatives and environmentally acceptable land based deposits. Dredging of the Helwick Bank, off the south-west coast of the Gower Peninsula, has caused concern amongst local communities not only in the direct shelter of the bank in between Worms Head and Port Eynon Point, but also further afield in Rhossili Bay, Port Eynon and Oxwich Bay. Links have been hypothesised between the erosion of South Wales beaches and the volume of material dredged.

Consequently, as a condition of the Crown Estates issuing a dredging licence, the dredging company must monitor the coastline nearest to Helwick Bank. Three cross sections have been established in each of Rhossili, Port Eynon and Oxwich Bay with a further section in Mewslade Bay and surveys have been ongoing at six monthly intervals since early 1993. Wallingford (1996) found that: the transfer of sand between Helwick Bank and the Gower beaches is weak; the Helwick Bank is larger and more stable than the other sandbanks lying off the South Wales coastline and that despite previous dredging, there is no overall loss in volume of the Bank. Therefore it is likely that the natural sediment transport processes have compensated for the volume removed. Furthermore, it was found that there were only modest changes in beach levels since 1993 and that these were likely to be a result of natural variations in wave conditions rather than as a consequence of dredging activities. These results agree with research undertaken to the east in Cardiff Bay where Phillips (1999) concluded that the erosion of Penarth beach was unlikely to have been caused by dredging activities.

Conclusions

There is undoubtedly an increasing awareness by the general public of environmental issues and recognition of the finite, frequently fragile and interconnected nature of coastal and marine ecosystems. The European Commission recently announced that almost 95 per cent of beaches in the EU met minimum quality standards in 1998, with the UK having 88.7 per cent passing these requirements. Compliance with legislation governing discharges into coastal waters including both the European Bathing Water and the Urban WasteWater Directives has resulted in this success. Unfortunately, there now appears to be a detrimental effect on the natural ecosystems in the coastal zone which, whilst only representing a small proportion of the total sea area, provides the majority of the biological production.

Evidence has shown that oceanic litter is an increasing problem, which cannot be solved simply by beach cleaning. It needs to be stopped at source otherwise it returns on the next tide. One of the causes is the charge made to ships for disposing of their waste at the ports, which is understandable as port authorities themselves have waste disposal costs. These costs are constantly increasing with additional landfill taxes. There is therefore an incentive for ships to discharge their waste into the sea prior to reaching port. A possible solution would be for waste to be accepted from the ships free of charge with the local authority disposing of it without charging the port authority. The benefits would be the savings from a reduced volume of litter on the beaches, a reduction in beach cleaning costs and the improved appearance of the beaches.

Tourism indirectly affects many aspects of conservation. The cleaning of beaches and coastal waters for human use is affecting wildlife and contributing to erosion. The argument that the proportion of beaches that are mechanically swept for the tourist industry is low in comparison with the rest of the coastline does not consider the potential implications. It is now recognised that coastal defences cause erosion elsewhere while Vlavianos-Arvanitis (1999) argued that human actions are interfering with environmental properties and processes in ways that have many unknown implications.

The construction of car parks and other tourist related developments using dredged aggregates often involves changes in land use. These conflicts also raise the possibilities of friction between those residents who depend on tourism and those who do not. Therefore studies with specific approaches and solutions based on scientific principles will be required to solve this complex problem. Hall (1997) argued that environmental scientists need to become involved in the actual practice of tourism development, especially where conservation areas are involved. Cipriani *et al* (1999) showed that a beach nourishment project in northern Tuscany, funded by the beach owners, was undertaken for short-term financial gain rather than being correctly designed in a sustainable way, to manage coastal erosion. Therefore,

it certainly cannot be the sole preserve of those who benefit financially. Indeed, in the Mediterranean, all countries recognise their interdependence on each other, and that a policy adopted by one country impacts on them all. Their environmental scientists are working with the industry towards sustainable tourism.

Although the coastline is dynamic and constantly changing, data collection has improved over recent years with the production of Shoreline Management Plans. The Welsh coastline is being monitored using air imagery, underwater side-scan sonar, geographic information systems (GIS) and virtual reality, and these high-tech methods will accurately record any changes to the coastline. It must be remembered however, that erosion only becomes a problem when the land is artificially valued more than the environment.

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Soil conservation in the Hammurabic Code

John McManus

Summary

The laws of Babylon as set down by Hammurabi nearly four millennia ago are the earliest codified forms of legislation available to us today. Translations from the cuneiform enable the reader to understand that matters agricultural were given high priority within the structure of the Code. References to flooding and irrigation demonstrate the importance given to these areas in that part of the Middle East at that time.

While it would be rash to claim that the great king Hammurabi, the sixth King of the First Dynasty of Babylon, was an active conservationist, translations of his Code carved into the 2.5m diorite column now housed in the Louvre Museum in Paris, show that importance was given to preservation of soils on fields in the 'fertile belt' of Mesopotamia, the land between the rivers Tigris and Euphrates, over 3750 years ago.

Although the people of the area had forsaken their nomadic lifestyle early in the fourth millennium BC, establishing competing settlements throughout the region, it was not until the late third millennium BC that they created writing, principally to record their economic practices. Legislation from the Sumerian period introduced by Urukigina (King of Lagash, 2355 BC) provided freedoms and social justice for the citizens. Later organised laws attributed to Ur-Nammu (2100 BC), to LipitIshlar (2017 BC) and to Eshnunna (1800 BC) are known to have existed for their local regions. Once he had defeated the Assyrians and effectively welded parts of the former Sumerian and Akkadian empires into a single country, in what is now central Iraq, Hammurabi selected the most acceptable customs and created from them a mature, organised and integrated code of conduct. This code, which was given physical form for all to see as a feature monument in Babylon, is the earliest known statement of the law to have survived in writing.

Set down in cuneiform script and using the Akkadian language, the Hammurabic Code has an extended preamble stating the importance of the king himself and of his subservience to a number of gods, principally to the sun-god Shamash. It also acknowledges the significant role of Adad, who in the epilogue, is identified as 'the lord of overflowing wealth, the controller of the sluices of heaven and earth' who among many others is called upon to move against any opponent to the code, 'deprive him of the rains from heaven and the flood-waters from the source, may he bring his land to ruin by famine and hunger, may he thunder in rage against his city and turn his land into a heap left by the flood.'

The main part of the text is devoted to inter-relationships between people, punishments for murder, theft and adultery, commercial dealings and the price of various commodities. In the 30 sections devoted to agricultural practice there are seven of relevance:

45 If a man has given his field for rent to a cultivator and further receives the rent for his field, and Adad afterwards inundates it or a flood has then carried away the soil, the loss shall be that of the cultivator.

46 If he does not receive the rent for his field, whether he has given the field in return for a half or a third share of the crop, the cultivator and owner of the field shall divide the corn which shall be raised on the field in agreed proportion.

47 If the cultivator, because he has not recovered his costs in the foregoing year, states that he will again cultivate the field, the owner of the field shall not refuse; his cultivator shall cultivate his field and at the harvest shall take corn according to his contract.

Here, it is recognised that accidents happen and that natural events may intervene in the affairs of man to the extent that nobody can be blamed. On this account the cultivator would have been unwise to pay in advance, for the law leaned in his favour. There is also an implication here that the newly deposited sediments carried onto the fields were not seen as being as beneficial to fertility as those deposited by the Nile floods at much the same period in time.

53 If a man has been slack in maintaining the bank of his field and has not maintained his bank and then a breach has occurred in his bank, and so he has let the waters carry away the soil on the water-land, the man in whose bank the breach has occurred shall replace the corn which he has caused to be lost.

54 If he is not able to replace the corn, he and his goods shall be sold and the tenants of the water-land, whose sesame the waters have carried away, shall divide the sum so obtained.

This is a rather stronger sanction than the Environment Agency currently enjoys, but the idea of compensation payable by a person shown to be responsible is not unknown today.

55 If a man has opened his trench for irrigation and has been slack and so has let the waters carry away the soil on his neighbour's field, he shall pay corn corresponding to the amount of the crop which his neighbour has raised.

56 If a man has released the waters and so has let the waters carry away the works on his neighbour's field he shall pay 10 'gur' of corn for every 'but' of land.

In other words, by all means irrigate your land, but do it carefully.

The three extracts presented, from the translation by Mack (1979), reflect the importance of attempting to preserve the good quality soils on which the communities relied for their sustenance. Irresponsible inactivity leading to the loss of even part of this material was considered a serious lapse on the part of the perpetrator. They also underline the significance of irrigation used by the farming community nearly 40 centuries ago, the recognition that good 'agricultural engineering' practice in maintaining the irrigation systems in good working order was important. However the Code also noted that natural river floods do occur and cause problems for even the best farmers in the flood plains of rivers. However, there was no attempt to consider that the losses should fall on any other than those directly involved in farming the sites concerned. There was no Tigris Insurance Company, no Euphrates Co-operative movement, no Mesopotamian Mutual Fund, and certainly no central Babylon Government subsidy to assist the primary producers, who were presumed to have done sufficiently well during good years to cover their losses during poor seasons.

Was Hammurabi a conservationist? Most certainly he was, for the need to preserve the soils for agriculture was seen to have very high priority for the existence and survival of the community. However, he was not against progress, as he recognised the importance of the developed irrigation systems which supported the agriculture of the area.

■ *Mack, R.E., 1979; The Code of Hammurabi. Republic of Iraq Ministry of Culture and Information, State Organisation of Antiquities and Heritage, Baghdad. 47pp*

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Charting a quieter life for Britain

As many as 12 million people in this country suffer from 'unacceptable' levels of transport and industrial noise, Environment Minister Michael Meacher said when he welcomed the first noise map of a UK city.

Birmingham City Council has developed state-of-the-art Sound Immission Contour Maps (SICMs) – colour coded maps of combined road, rail and aircraft noise – of the city. The noise maps have implications for local authorities for planning and transport and have been developed ahead of a potential EU Directive.

Speaking at *Action Against Noise – The Birmingham Noise Maps* at the National Exhibition Centre in Birmingham, Mr Meacher said the National Noise Attitudes Survey showed that one in three people considered environmental noise spoiled their home life to some extent and 1 per cent said their home life was totally spoiled by noise.

'These are genuine concerns which we take very seriously and we need to take action to avoid increases in noise from transport and industry, which we call ambient noise, and wherever possible we must find ways to reduce existing noise levels to minimise the disturbance to people's lives.

'Therefore, I enthusiastically welcome the results of this two-year, innovative project which charts the way for producing a national noise map. The Birmingham Noise Maps can also be used as a blueprint for other cities to model their noise and tackle social, economic and health problems caused by unacceptable levels of noise.'

Mr Meacher added that ways to strengthen legislation and controls and help local authorities combat noise were continually being sought and that the forthcoming Urban White Paper would provide an opportunity to focus on what could be done to improve the quality of life in urban areas.

The Green Paper on Future European Noise Policy in 1996 showed around 20 per cent of the population – 12 million people in the UK – are exposed to ambient noise at levels which scientists and health experts consider unacceptable – where most people become annoyed, sleep is disturbed and adverse health effects are feared.

The Birmingham event was the first of five seminars to environmental health, planning and acoustic professionals around the UK, looking at the Birmingham Noise Maps and implications for the UK in the future.

John Hinton, architect of the Birmingham Noise Maps and co-chair of the EC Working Group on Noise Mapping, said:

'This is just the first step in an exercise. The next step is to put this noise mapping information into a geographical information system and determine the number of people in Birmingham who are living in houses exposed to various noise levels. Then we will be able to develop a noise reduction and controlled action plan to reduce this exposure.'

The five seminars were held during February and March in Birmingham, London, Edinburgh, Cardiff and Belfast.

■ *The Production of Noise Maps of the City of Birmingham is published by the DETR at £17.00 and is also available at www.environment.detr.gov.uk/noise.*

Local authorities have had powers to deal with noise since the 19th century. Since the Wilson Report in 1963, legislation to protect the local environment and controls to reduce the emissions from sources of noise have been put in place.

A National Noise Attitudes Survey in 1991 (currently being updated) also identified that 28 per cent objected to noise from road traffic and 22 per cent to noise from neighbours. It found that road traffic noise was audible outside more than 90 per cent of homes.

Measures already being undertaken to reduce noise at source and mitigate its effects include:

ROAD

- maximum noise limits from engines and exhausts
- working to implement EU standard to limit tyre noise
- quieter road surfaces

AIR

- developing quieter aircraft
- regulation and control of aircraft operation near airports

RAILWAYS

- Working with the EC on developing noise standards for new freight wagons and high speed intercity trains
- Voluntary agreement reached to reduce noise from freight train wheels throughout Europe

Sheffield gets regeneration company

Sheffield's efforts to rejuvenate its city centre have been boosted by the news that it is to get the country's third pilot urban regeneration company (URC) to co-ordinate its regeneration programmes.

The city joins Liverpool and East Manchester in the trial scheme, which was one of the key recommendations of the widely-acclaimed Urban Task Force report published last year. The URCs were the first of the recommendations to be put into practice and aim to provide a focus and overall plan for regeneration activity in their areas.

Announcing the Sheffield URC, Hilary Armstrong, the Regeneration Minister, said: 'This new company will be charged with developing a vibrant and attractive city centre for Sheffield – a place where people want to live and work. The centre was hit hard by the fall in the steel industry and other major employers, but the city has worked hard to turn this decline around. The Supertram and flagship developments like Heart of the City have brought more

interest into the centre and the private sector is coming back.

'These improvements need to be encouraged and I believe an urban regeneration company will provide the ideal opportunity to make sure this happens. This is the third – and final – pilot scheme. We will be watching closely to see how well these companies can pull together regeneration, housing and transport programmes to improve the quality of life in the city centres and create an urban renaissance.'

The Government is pushing forward with its programme of urban regeneration initiatives in the lead up to the Urban White Paper, to be published next summer. This will run in tandem with the Rural White Paper, as efforts to bring people into city centres are directly linked with the aim of reducing pressure on the countryside and improving the quality of life in rural areas.

The Sheffield URC is made up of a partnership of Sheffield City Council, English Partnerships and Yorkshire Forward, each of which has contributed £250,000 for setting up and running it for a year. The company includes nine board members, with Barclays Bank chairman Sir Peter Middleton as chair and Yorkshire Bank chairman Sir Hugh Sykes as deputy chair.

New guidance on water recycling

Recycling 'grey' water – re-using bathwater, dishwater and other water for non-drinking purposes, such as toilet-flushing or garden-watering – will be easier, thanks to new guidance issued by the water industry, according to Environment Minister, Chris Mullin.

The Water Regulations Advisory Committee (WRAC) has recommended new guidance on water recycling systems to the Government. This guidance has been prepared by the Water Regulations Advisory Scheme and contains useful information on how to install, modify and maintain these systems so that they don't contaminate drinking water.

'One of the lessons learned in the last century is that we must not squander our natural resources, but use them wisely and with care,' Mr Mullin said. 'Our impact on the environment has to be sustainable. The Government welcomes this sensible guide for those wanting to protect our planet, but not in a way that damages their health.

'More and more people are keen to conserve water and to put the water they have already used, such as bath or dishwater, to another use. Some people want to go one step further and install systems to reclaim used water. However, they may have questions on what is the best and safest way to go about this. Conserving and recycling water is a great idea – you'll probably save money too – but people need to be sure that their water recycling system doesn't contaminate drinking water supplies. This new guidance will help people to "do their bit" safely.'

This information will be useful to manufacturers of such systems, to installers and to the public. The guidance doesn't just concern public health – one useful tip is that gardeners are warned not to use 'grey' water to water plants which only thrive in acidic soil.

The Water Regulations Advisory Committee's remit is to advise the Secretary of State for the Environment, Transport and the Regions on the technical requirements for plumbing installations and fittings to be included in regulations made under section 74 of the Water Industry Act 1991. The chair of the Committee is Professor John Swaffield of Heriot-Watt University.

The Water Regulations Advisory Scheme consists of representatives of the water companies and ensures consistency in the enforcement and implementation of the Water Supply (Water Fittings) Regulations 1999 which are made under section 74 of the Water Industry Act 1991.

Proposals unveiled to cut fuel bills and greenhouse gas emissions

Government proposals for new energy efficiency measures to help low-income consumers will also tackle climate change, Energy Efficiency Minister Lord Whitty has announced.

Energy Efficiency Standards of Performance (EESOPs) require the electricity and gas companies to encourage and help their domestic customers save energy.

The new Government-set EESOP (EESOP 4) will start in 2002, taking over from and expanding the present Regulator-set scheme. It will continue to give particular help to low-income consumers and contribute to the Government's attack on fuel poverty, generating a total saving of £275 million for UK consumers every year. It will also cut greenhouse emissions by an extra 750,000 tonnes of carbon a year.

The Government's draft Climate Change Programme integrates environmental, social and economic concerns, with measures that Lord Whitty says will be good for the environment, for the economy and for people. Energy efficiency is a key component, saving householders money, providing warmer, healthier homes, generating jobs and training opportunities – as well as cutting greenhouse emissions.

'We estimate that priority households will benefit by around £22 on average a year from EESOP 4 programmes by 2005, in lower bills or increased comfort, benefiting year after year,' Lord Whitty said. 'Better-off householders should benefit by around £7 a year.

'These savings are on top of the savings of up to £50 a year that Ofgem Regulator Callum McCarthy expects to come from the strong regulatory measures that the Government and he have put in place.

'The Government's discussions with the energy industry, consumer and environmental groups and others have confirmed that EESOPs can continue to work just as effectively within the new framework for energy being put in place by the Utilities Bill. And it is clear that the energy industry wants to be engaged in the challenge of climate change.'

This section of the Journal is in response to the growth of news, information and activities which underpin the Education Committee of the IES.

Special prominence is given to student activities and projects, national and international initiatives, campus developments and research in order to capture the diversity, wealth and vitality of modern environmental education.

Readers are invited to send articles and letters to:
- ***Derek Blair, School of the Environment, University of Sunderland. Benedict Building, Sunderland SR2 7BW.***
- ***Tel: 0191 515 2737.***
- ***Fax: 0191 515 2741.***
- ***E-mail: derek.blair@sunderland.ac.uk***

QAA subject benchmarking statement on environmental studies: the IES response

The consultation period for the QAA statement on benchmarking for the Earth Science, Environmental Sciences and Studies area is now over. The IES was invited to comment on the panel's document. The following points are taken from its official response to the QAA, which was submitted in March 2000.

The Benchmarking Statement is seen by the IES as an important document in the articulation and definition of the interdisciplinary area of Environmental Sciences which became noted in the 1990s for its breadth, proliferation and relevance. The IES's field of professional interest and concern is substantially in the academic area the Panel described as ES3 but also goes beyond into other academic subject areas such as Geography, Biology, Built Environment. The following comments, however, relate to only ES3.

ES3 is characterised in the introduction of the document by 'a focus on Earth systems in order to learn from the past, understand the present and influence the future; an emphasis on field based investigation, the multi-disciplinarity and inter-disciplinarity of their approaches; the range of spatial and temporal scales that they cover; and the development of graduates capable of using their powers of observation, analysis and imagination to make decisions in the light of uncertainty.'

ES3 has a wide remit, ranging from the scientific study of physical characteristics and environmental systems of the earth to the social and political issues of human relationships with the environment, explicitly in the context of sustainability. The IES considers that these are fundamental to modern professional practice in the environmental sector.

The panel has wisely not attempted to explicitly define the core curriculum of ES3 but has expressly identified the knowledge and graduate skills, learning and teaching methods, assessment process and performance levels common to each of three constituent parts: earth sciences, environmental sciences and environmental studies,

The outline subject knowledge statements of these components of ES3 recognise that each undergraduate award will have its own characteristics with a detailed rationale for the content and organisation outlined in its respective specification. The IES welcomes the flexibility and diversity this encourages in the market place and believes it accords with professional practice needs.

The panel's mapping of the composition of ES3 territory helped to describe the diversity and, what some perceive, confusion in the environmental sciences' field. A Venn diagram creatively and effectively helped to portray the academic boundaries and internal relationships in the ES3 field in which Geology was also represented. Over 75 award titles are listed within the panel's remit, but only half of which have environmental in their title. These range from Applied Earth Science to Water Science and include minority specialisms such as Planetary Science, Fossils and Evolution and Surveying, reflecting the confusing range within the so-called environmental field. The further difficulty in distinguishing the Environmental Sciences/Studies divide is apparent especially when other awards at the interface with ES3 (another 30 in number) have been included.

The IES in its accreditation process interrogates and places high value on the science content of environmental courses within a culture of interdisciplinarity and context of sustainability. These aspects have been addressed reasonably by the panel.

Finally, the IES is pleased that the draft statement stressed the relevance and vital importance of specific skills such as fieldwork, laboratory work, IT, and of key graduate skills which are vital for careers in the environmental sectors. An attempt has been made to

relate performance levels to learning outcomes through appropriate learning strategies.

To achieve a given level of performance, it is proposed that students should demonstrate this achievement across six categories of performance. intellectual, practical/applied, communication, numeracy/C&IT, interpersonal/ teamwork, self-management/professional development.

For each, three levels of performance are identified.

- **'Threshold':** the minimum performance required to gain an honours degree.
- **'Typical':** the performance expected of students at the lower/upper second class boundary.
- **'Excellent':** the performance expected of first class honours students.

In summary, the IES welcomes the Benchmarking Statement for ES3. It is currently reviewing and relating the benchmarking principles to its own course accreditation activities. The IES, in its role as a professional body addressing the multi- and inter-disciplinary area of environmental science/ studies in the context of sustainability, believes important progress is being achieved.

Derek Blair

ENVIRONMENTAL INFORMATION

Latest estimates show continuing decline in carbon dioxide emissions

Emissions of carbon dioxide, the main 'greenhouse gas', fell by 7½ per cent in the UK between 1990 and 1998, according to new estimates published by the DETR.

The Department has also published a provisional 1999 estimate of carbon dioxide emissions, showing a ½ per cent reduction compared with 1998.

Other key points in the new estimates are:

Greenhouse gas emissions

- Emissions of the 'basket' of six greenhouse gases, weighted by global warming potential, fell by 8½ per cent between 1990 and 1998. To meet its commitment to the Kyoto Protocol, the UK has agreed to reduce emissions by 12½ per cent relative to the 1990 level over the period 2008-2012.
- Emissions of carbon dioxide, the main greenhouse gas, fell by 7 per cent between 1990 and 1998. The UK aims to move beyond the Kyoto target towards its goal of reducing emissions of carbon dioxide by 20 per cent below 1990 levels by 2010.
- 1999 emissions of carbon dioxide are provisionally estimated at 155½ million tonnes, about ½ per cent lower than in 1998 and 7½ per cent lower than in 1990.

Air emissions

- Emissions of all the main air pollutants, apart from ammonia and selenium, maintained a downward trend and fell between 1997 and 1998.

Emissions on a UNECE/CORINAIR basis

Greenhouse gas emissions

Total **carbon dioxide** (CO_2) emissions fell by 6½ per cent between 1990 and 1998, mainly because of greater use of gas and reduced use of coal in electricity generation and increased use of nuclear-generated electricity.

Emissions from road transport rose by 6 per cent between 1990 and 1998.

Methane (CH_4) emissions fell by 28 per cent between 1990 and 1998.

Nitrous oxide (N_2O) emissions fell by 15 per cent between 1990 and 1998.

Air emissions

Nitrogen oxides (NOx) emissions fell by 37 per cent between 1990 and 1998.

LCP emissions fell by 61 per cent between 1980 and 1998 compared with the LCP reduction target of a 30 per cent reduction by 1998. Compared with the original baseline of 1,016 thousand tonnes in the Directive, emissions fell by 64 per cent between 1980 and 1998.

Sulphur dioxide (SO_2) emissions fell by 57 per cent between 1990 and 1998. They fell by 67 per cent between 1980 and 1998 compared with the UNECE Second Sulphur Protocol targets of a 50 per cent reduction by the year 2000, 70 per cent by 2005, and 80 per cent by 2010.

Emissions from Large Combustion Plants (LCPs) fell by 65 per cent between 1980 and 1998 compared with the EC LCP Directive target of a 40 per cent reduction on 1980 levels by 1998 and 60 per cent by 2003. Compared with the original 1980 baseline of 3,883 thousand tonnes in the Directive, emissions fell by 69 per cent between 1980 and 1998.

Particulate (PM10) emissions fell by 41 per cent between 1990 and 1998.

Black smoke emissions fell by 42 per cent between 1990 and 1998. Trends by main sources are similar to those for particulates.

Carbon monoxide (CO) emissions fell by 31 per cent between 1990 and 1998.

Non-methane volatile organic compounds (VOCs) fell by 26 per cent between 1988 and 1998 compared with the UNECE VOC protocol target of a 30 per cent reduction by 1999 on 1988 levels.

Benzene emissions fell by 39 per cent between 1990 and 1998.

1,3-butadiene emissions fell by 46 per cent between 1990 and 1998.

Ammonia emissions fell by 4 per cent between 1990 and 1998.

Hydrogen chloride emissions fell by 67 per cent between 1990 and 1998.

Heavy metal emissions fell between 1990 and 1998 as follows:

Metal	Reduction (%)
Lead	65
Vanadium	50
Zinc	32
Nickel	49
Selenium	35
Arsenic	46
Copper	55
Chromium	53
Mercury	61
Cadmium	50

Environment minister challenges local authorities and industry: Help clean up Britain

Guidance on cleaning up Britain's historic legacy of contaminated land has been launched by Environment Minister Michael Meacher.

He challenged local authorities and industry to do their bit to make the clean-up a success and he is writing to Chairmen of major companies to lay down the challenge.

The new regime sets out a modern, scientifically-based system. Local authorities will have a duty to inspect their areas to find contaminated land and then ensure that it is decontaminated. The regime sets out what remediation standards should be applied, and who should pay. The Environment Agency has a supporting role, regulating some categories of site, and providing technical advice and support to local authorities.

Extra funding for local authorities and the Environment Agency to support implementation of Part IIA was announced in July 1998. £50 million of extra provision over three years was given through the Comprehensive Spending Review. This was in addition to the already-planned £45 million capital programme for site investigation and remediation.

Michael Meacher has issued statutory guidance to local authorities and the Environment Agency which sets out key details of how they should carry out their functions under the new regime. The statutory guidance covers:

- the definition of contaminated land
- the identification of contaminated land
- the remediation of contaminated land
- exclusion from, and apportionment of, liabilities for remediation, and
- the recovery of the costs of remediation.

The new regime sets out five key points:

- focus – having a new, specific system for contaminated land will help to make sure that authorities take a strategic approach to dealing with this problem;
- transparency – this improved focus, together with the detailed rules and procedures set out in the guidance will help authorities to demonstrate that they are doing the right things: reassuring local communities that they are finding problem sites, and explaining to business why they might have to pay for remediation on those sites;
- integration – the new regime enables all of the different problems on a site to be tackled together; this used to require separate action under different regulatory regimes;
- consistency – the detailed rules will increase the consistency of approach taken by different local authorities.
- better tools – the new regime provides a more effective set of tools for regulating contaminated land. Local authorities and the Environment Agency will be better able to force polluters to pay for remediation. And businesses will be better able to know what they need to do to make their own sites safe, and thereby avoid regulatory control.

Local authorities will be challenged to carry out their new roles diligently and effectively. The Government has already announced significant additional funding for local authorities, and now wants to see that funding used to support work on contaminated land.

Industry will be challenged to accept responsibility, and to act responsibly. Many companies already have positive programmes in place to identify and clean up the sites which they have polluted in the past. Others should follow suit.

Under the new regime every company which may have responsibility for contaminated land problems should actively draw up a strategy for finding those sites and cleaning them up rather than waiting for the regulators to visit.

Mr Meacher said: 'I am challenging local authorities and business to make the new regime a success – together we can protect local communities and the environment from the risks and the blight that contaminated land can cause.

'I will be writing to the Chairmen of our major companies, setting out this challenge, and asking them to inform me when they have a strategy in place.'

The new contaminated land regime came into force in England on 1 April 2000.

It provides an improved system for the identification and remediation of contaminated land, where the contamination is causing unacceptable risk to human health or the wider environment. The extent of any risk will be assessed in the context of the current use and circumstances of the land.

Under the new regime every company which may have any responsibility for contaminated land problems should actively draw up its own strategy for finding those sites and cleaning them up. Each company strategy should do the following four things:

- put a programme in place to investigate its own history, to identify the problem sites for which it is responsible;
- make a clear commitment to meeting its responsibilities for cleaning-up those sites;
- provide the necessary funding to make sure that this can happen; and
- make these commitments public.

The statutory guidance, which has previously been the subject of extensive consultation in 1996, 1998 and 1999 and was subject to Parliamentary approval under the negative resolution procedure, is set out in DETR Circular 2/2000 *Contaminated land: implementation of Part IIA of the Environmental Protection Act 1990.*

As well as the statutory guidance, the circular includes:

- a statement of Government policy in this field,
- a description of the new contaminated land regime, and
- a guide to the Regulations and Commencement Order.
- *Paper copies of the circular can be obtained via the Stationery Office order line (0870 600 5522).*

It is also available from the DETR web site:

http://www.environment.detr.gov.uk/contaminated/land/index.htm.

Panel on sustainable development calls for new priorities

An urgent re-ordering of priorities, combined with co-ordinated long-term energy strategies, is essential if we are to protect our environment, an expert environmental panel has urged.

The Government Panel on Sustainable Development, an independent advisory group, has published its sixth and final annual report. As well as urging all parts of society to give a high priority to environmental protection, the report highlights the need for a long term co-ordinated energy strategy, and looks at particular environmental issues including genetically modified organisms, world trade, investment and sustainable development, noise nuisance, the ethics of biotechnology and fisheries.

The panel's convenor, Sir Crispin Tickell, said:

'When the panel was first established in January 1994, the somewhat slippery concept of sustainable development was peripheral to mainstream thinking and policy on the environment. That is no longer so, as successive Government responses to our reports demonstrate.

'The panel has had a significant impact on Government policy, but perhaps its most significant achievement has been the Government's positive change of attitude towards issues of sustainable development, especially in the field of the environment.

'There remains much to do. Progress has been variable. The panel believes that points of particular importance for the future Commission on Sustainable Development are:

the need to develop better means for determining the real cost of environmental policy; to cope with the widespread impacts of climate change; to deal more effectively with the disposal of waste, including radioactive substances; to ensure the quality and supply of fresh water; and to do more to encourage energy generation from renewable sources.

'There is a critical need, already recognised by many in the fossil fuel industry, for a long term co-ordinated energy strategy. Together these problems go to the roots of human society and its sustainability, here and elsewhere.

'The Government has already given a lead, particularly over climate change, but a reappraisal and re-ordering of priorities is essential to protect the environment and the natural resource base on which we all depend.'

Climate change report welcomed

The fifth report on climate change in the UK issued by the Select Committee on the Environment, Transport and the Regions has been welcomed by John Prescott, the Deputy Prime Minister.

'The Government welcomes the select committee's report as a constructive contribution to the development of a climate change programme for the UK,' Mr Prescott said.

'There is a great deal in the committee's report with which we agree. The committee has also recognised that, with publication of a draft UK programme on 9 March, the UK is leading the way internationally in the fight against climate change. We will now fully consider the committee's detailed findings and publish a formal response as soon as possible.'

Commenting on some of the committee's recommendations, the Minister said the Government's draft climate change programme set out a robust, strategic and far-reaching approach to meeting climate change targets.

'The policies and measures that are included in the programme should mean a cut of 21.5 per cent in greenhouse gas emissions below 1990 levels by 2010. This is almost double our Kyoto target and equates to a cut of 17.5 per cent in carbon dioxide alone.

'The Government has set a goal to cut carbon dioxide emissions by 20 per cent by 2010.

'Transport and domestic sectors will make substantial contributions to emissions reductions. EC voluntary agreements with car manufacturers to improve fuel efficiency by at least 25 per cent by 2008, should deliver savings of 4 million tonnes of carbon equivalent (MtC) and Energy Efficiency Standard Of Performance (EESOP) should help to stimulate savings of 2.7-3.8 MtC.

'Another important contribution will come from the government's target to generate 10 per cent of our electricity from renewable sources by 2010.

'We agree that we must now encourage the public to understand the importance of their action in the fight against global warming. We are spending £25 million on the award-winning "Are you doing your bit?" publicity campaign over the next three years.'

At Kyoto in December 1997, developed countries agreed to reduce emissions of a basket of greenhouse gases overall to 5.2 per cent below 1990 levels over the period 2008-2012. The European Community agreed jointly to an 8 per cent reduction. In June 1998, under the UK Presidency, this target was shared out between member states and the UK agreed to a reduction of 12.5 per cent. In its manifesto, the UK Government also set out a domestic goal of reducing carbon dioxide emissions by 20 per cent below 1990 levels by 2010. The devolved administrations have also now agreed to adopt this goal.

The UK is only the third European country to publish details of its programme for meeting its Kyoto target. *Climate Change: Draft UK Programme* was published on 9 March and a final UK climate change programme will be produced later in the year.

The editor of Environmental Scientist can be contacted at:

PO Box 16
Bourne
Lincs
PE10 9FB

The Hon. Secretary's news desk…

Future professional developments

During 1999, CIWEM carried out a consultation exercise within their own membership and with other environmental bodies. They also produced a leaflet entitled *A Time for Change*, looking at possible future developments in their own institution and in the wider environmental field. At the instigation of the IES, a series of meetings are now in progress under the chairmanship of Dr Michael Romeril to carry forward and develop the ideas set out in that document. A widely representative group of environmental institutions are involved in these discussions and the main topic under consideration is the setting up of a new environmental body representative of all interests. The nature and constitution of such a body is still a matter for debate but it is hoped that one outcome could be the availability of chartered status through this new body.

Watch this space.

EAF Grant Aided Project

The research project relating to the professional institutions and training for sustainable development has reached the end of its first year of activities. The original partners of the IES, The Natural Step, CEE and the Environment Agency have been joined by an energetic team from WWF. Generous funding of £13,000 has also been provided by WWF to match the DETR grant of £24,500 (approximately) for the first year.

After a slow start from April of last year, 14 institutions and professional bodies have participated in the project with significant and enthusiastic contributions. The project is meeting the targets set in the two year overall programme and has now reached agreement on a framework document. A draft set of recommendations has also been prepared. During the second year it is intended that a range of more detailed and particular training documents and aids will be developed and produced.

Annual General Meeting

At the 27th Annual General Meeting on 8th March 2000 the size of Council was reduced to a maximum number of 20. This was part of a streamlining of procedures which has been going on for some time. Even at this reduced level there are still one or two vacancies.

Although the work carried out by the secretariat has been expanding steadily for some time, the Institution still relies heavily on voluntary contributions from members to achieve any significant development. Anyone prepared to make a commitment of time and effort is invited to volunteer for service on an appropriate committee (please write to me at the Institution).

At the Council Meeting immediately following the AGM the existing officers and Chairmen of standing committees were elected or appointed for a further year.

Responses to consultations

After an exceedingly busy start to the year, just one further response was submitted to the DETR during February dealing with *Modernising planning: improving enforcement appeal procedures* and prepared by Jim Whelan.

Subscriptions

Subscription reminders were sent out at the end of March to over 25 per cent of members. This is a time consuming and costly exercise which uses valuable resources needed elsewhere. Determined efforts are being made to move the environmental profession forward and enhance the status of all our members. We do need your continuing support, however, to achieve progress and your prompt subscription renewal is the simplest sign of confidence.

For those of you contemplating a move and change of address, ***please*** remember to advise the Secretariat of all the relevant changes. A break in communication is a significant factor in our loss of members from year to year.

New members

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

Mr R. S. Brunt	Postgraduate Student University of Edinburgh
CEESR	Associate of the Institution Kingston University
Miss S. L. Clegg	Environmental Scientist Defence Evaluation & Research Agency
Mr M. D.Doodes	Student University of the West of England
Dr. R Elangovan	Recent Graduate
Mr J. Foster	Compliance Scheme Co-ordinator Biffa Waste Services Ltd.
Mr A. Hadjichambis	Teacher, Cyprus
Mr S. D. Henderson	Environmental Consultant Atticus Consultancy
Mr L. Lopez-Parodi	Student, University of Glamorgan
Mr M. D. Mason	Instrument Supervisor L.E.S. Engineering
Mr S. J. Newcombe	Environmental Protection Officer South Somerset District Council
Ms C. R. Roberts	Head of School of Environment Cheltenham & Glos. College of HE
Mr R. Shewan	Postgraduate Student Manchester Metropolitan University
Dr O. A. Sodeinde	Senior Lecturer Ogun State University, Nigeria
Mr D. H. Stevens	Environment Officer Morriston Hospital
Miss L. A. Torbit	Scientist, Scottish Environment Protection Agency
Mr Y. V. Violaris	Researcher University of Surrey

Forthcoming events

5-9 June 2000
Healthy environments: the local challenge
Oslo, Norway
Call for papers. Conference covers local communities' involvement in developing healthy environments.
Details: PLUS Convention Norway A/S, P.O. Box 1646 Vika. N-O 119 Oslo 47 67 56 90 12,
e-mail chaskim@online.no

13-15 June 2000
The science of air quality monitoring
CRE, Stoke Orchard, Cheltenham
Short Course providing an understanding of the methods of air quality monitoring, together with practical demonstrations. £675
Details: Katherine Briggs, CRE Group Ltd, Stoke Orchard, Cheltenham, Glos, 01242 673361
e-mail: enquiry@cregroup.co.uk

21-22 June 2000
Surface transport 2000
TRL, Crowthorne, Berkshire
Exhibition demonstrations and conference with seminars on environmental issues, recycling, pavement management, electronic fee collection, road design and safety.
Details: Patricia Pascoe, Transport Research Laboratory, Old Wokingham Road, Crowthorne, Berks, RG45 6AU
01344 770166
e-mail: ppascoe@trl.co.uk

4-7 September
International conference
Society for Ecological Restoration, Liverpool
A conference to share experience and expertise in ecological restoration
Details: SER 2000 Conference Secretariat, c/o SJS Business Services Ltd, PO Box 17, Newton le Willows, Merseyside WA3 2FQ
e-mail: ser2000@netcomuk.co.uk

4 -8 September 2000
Monitoring for nature conservation
Plas Tan y Bwlch, Snowdonia National Park Environmental Studies Centre, Wales. Short course to further the knowledge and skills necessary, for the effective monitoring of sites of nature conservation interest. £220-440
Details: Dewi Jones, Plas Tan y Bwlch, Maentwrog, Blaenau Ffestiniog, Gwynedd. LL41 3YU
01766 590324. e-mail: plastanybwlch@compuserve.com

28-30 September 2000
International waste management conference
Trier, Germany
Will examine new methods in waste management. Details: VKS-ACR Saarbruken/Germany
Fax +6819 7130 109
e-mail: c.bluemling@zkesb.de

3-5 October 2000
The science of air quality monitoring
CRE, Stoke Orchard, Cheltenham
Short course providing an understanding of the methods of air quality monitoring, together with practical demonstrations £675
Details: Katherine Briggs, CRE Group Ltd, Stoke Orchard. Cheltenham, Glos.
01242 673361
e-mail: enquiry@cregroup.co.uk

Diary dates 2000

5 July	Education Committee	10.30
5 July	Council	13.30
11 September	GP Committee	13.00
1 November	Education Committee	10.30
1 November	Council	13.30
1 November	Burntwood Lecture	18.30

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- From waste to woods: trees on landfill and their place in landscape
- Enhanced landfill strategy
- Waste minimisation: the long term benefits
- European study on EISs of installations for the treatment and disposal of toxic and dangerous waste
- Mercury fall-out from crematoria

Education and training

- Environmental courses undergo a quality assessment
- Student environmental declaration
- On-line information systems in environmental sciences courses
- Global environmental charter and network for students

Business and industry

- The tourism challenge
- The tourism debate and environmental scientists
- Enjoying environmental science as a career
- The Brent Spar and the best practical environmental option

National and local government

- Transport policy, environmental pressures and the new UK government
- Local Agenda 21 – making it work

Price: £5 per paper including p&p
(£3 per paper for members)

Contributors

The *Environmental Scientist* aims to provide a forum for members' contributions, views, interests, activities and news, as well as topical feature articles. Articles up to 3000 words should be submitted to the Editor three weeks prior to publication in the last week of January, March, May, July, September and November. In future all communications to the Editor should be routed through the Institution at PO Box 16, Bourne, PE10 9FB.
Views expressed in the journal are those of the authors and do not necessarily reflect IES views or policy.

Advertising

Advertisements should be submitted to reach the Institution by the 7th of the month of publication. Rates: £50 (half page); £25 (quarter page); £12.50 (eighth page). Full page adverts at £100 can only be accepted under special circumstances, subject to space being available.

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