SHERKIN COMMENT

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Memories of Summer

Water-loving Wild Flowers

Stream Water-crowfoot (*Ranunculus penicillatus*)
Photograph by Robbie Murphy

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Editorial

The Need for Cawley II

By Matt Murphy

IN the previous issue of *Sherkin Comment* I summarised the main issues of the Cawley Report on the Seafood Industry. I noted that marine research was not part of its brief. I believe it is now imperative that the Minister of Fisheries, Mr. John Browne, T.D. commissions an in-depth report on the research needs of the fishing industry – both commercial and aquaculture. At present we lack comprehensive data on most fish stocks in Irish waters. In many cases there is great difference between scientists and fishermen as to what the true stock situation is. Trust is the major problem and this issue must be solved. This is not an Irish problem, it is the norm worldwide between fishermen and scientists. The Canadians and Australians have begun to address this issue and fishermen and scientists now work as equals, with very positive results on fish stock data.

The Cawley report has emphasised throughout that BIM and Udaras must take the lead role in the development of the Seafood industry. It is therefore essential that there be detailed discussions with the Fishermen's Federation about what they believe are the major failings in our fishery research programmes, and then involve the Marine Institute.

The Marine Institute have excellent fish scientists but one must question have these been getting a fair share of the funding within the Institute? Unfortunately there is widespread belief that they haven't – so one must question whether the Marine Institute has a commitment to the fishing industry.

In their two volume "Sea Change" (2007-13) publications it is obvious that the Institute sees itself being the major player in many fields associated with the marine sector such as:

- Marine and freshwater environmental monitoring
- National energy needs and building an expert-orientated
- Exploring the unique ocean environments of the Irish seabed to identify organisms that have specific application in the pharmaceutical and chemical industry.
- Developing new tourism offerings in angling, boating and water sports.
- Playing a lead role in developing a better scientific understanding of climate change.
- Strengthening the research and innovation intensity of the indigenous marine industry.

There is no doubt that the role of the Marine Institute has been changed from its statutory obligations as when it was at Abbotstown. Then most of its research and monitoring roles were centred on fisheries.

Anyone reading "Sea Change" can see that fisheries will be a small part of the programmes to be undertaken by the Institute. Therefore it is obvious that an in-depth examination by BIM of fisheries research must be undertaken so that we can have a sustainable fisheries for the future. It seems from the two volumes "Sea Changes" that the Marine Institute wants to have a finger in every aspect of the marine. It would be much more sensible if priorities were established and certain programmes transferred to other agencies.

One of the most important aspects of fisheries research in Ireland that has been ignored, in the main, is inshore fisheries. According to the Cawley Report we have over 1,360 vessels giving employment to fishermen and which are the mainstay of employment in many areas of coastal Ireland. There is a vital necessity to establish the maximum annual take in the bays around our coast for such species as shrimp, crab, lobster. BIM must prioritise these fisheries. They have huge potential for development and the easiest of stocks to control.

The Central Fisheries Board (CFB) and the seven Regional boards have overseen our inland waters. Their responsibility has been freshwater fish stocks, including salmon. Yet the issue of salmon management and research has been divide. The former Salmon Research Station in Co. Mayo, for many years an independent research facility funded by Guinness, is now under the control of the Marine Institute. This is a peculiar situation – surely this research should be transferred to the Central Fisheries Board who already have responsibility for the management of rivers and estuaries? Also, sea angling, which at present is the remit of the Central Fisheries Board, should continue to be developed by them and not the Marine Institute.

Marine research in Ireland is too disjointed. Over 20 institutes in the State are involved in some way or another. Thus I suggest that the three Messers Cawley, Murrin and O'Bric , who produced Cawley I, should be invited to produce Cawley II on marine research. They have delivered a superb document "Steering a New Course – Strategy for a Restructured, Sustainable and Profitable Irish Seafood Industry 2007-2013", which the government endorse. They now have an excellent understanding of the marine environment. There are many questions that need to be answered about the Marine Institute programmes (2007-2013). A number of these programmes belong elsewhere with either BIM, the EPA, Udaras na Gaeltachta, Central Fisheries Board and the Martin Ryan Institute.

The Marine Institute seems to want to undertake a huge programme of research. It seems to have a desire to play on the world scene on a grand scale. We are now entering the post Celtic Tiger period, when there will be cuts in funding on all fronts from Central Government. The Marine Institute should realise therefore that funding could be less forthcoming in the future. Consolidation is necessary and a priority list of their programmes is needed.

It must not be forgotten that in the 1970s and 1980s a small band of wonderful scientists at Abbotstown the former home of the Marine Institute suffered greatly from cutbacks in their annual budget. So much so they were not allowed travel to various parts of the country to do research. Maybe we will not see these days again (we hope!) but yes, there will be cutbacks even with a soft landing in our economy. So a little caution on our marine research projects is necessary. Let there be consolidation first on the current research programmes.

One of the major recommendations of the Culliton review of Industrial Strategy in the late 80's / early 90's was to remove industrial policy from the IDA and place it in a new organisation i.e. Forfás.

It appeared that the IDA, as well as attracting foreign investment (which it did very successfully), had become involved in industrial policy formulation.

The Culliton Review saw the need for the separation of policy formulation from implementation and recommended a structural change to insure that separation. He also recommended that the new independent structure should also oversee policy implementation, monitor agency performance and armed with its policy research knowledge and agency performance information, have a co-ordinating role as regards all industrial development activities in the state. Nearly all the recommendations of Culliton have been implemented and the major structural administrative and organisational deficiencies, which existed up to that point in industrial development strategy, have been put right. It is necessary, I believe, that Culliton be applied to the marine sector and policy be taken out of the hands of the Marine Institute.

Cawley I has delivered a strategy for the seafood industry. We now need Cawley II to deliver a strategy for marine research. As a whole it would seem that Cawley I Strategy Report on Seafood and the Marine Institute's "Sea Change" programme differ on who should have the responsibility for certain developments. The Marine Institute has an essential role to play in the marine sector but it must be realistic and realise that some agencies have far greater expertise and knowledge than it. All that is missing from their mammoth two volume "Sea Change" is an expedition to find the mythical Hi Brazil, somewhere out in the Atlantic. A marine research institute is vital for the development of a country's marine sector. Image-making may succeed in the short-term but in the end reputations are made by the quality of the work.

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THE SKERRIES ISLANDS

By Oscar Merne

IN many English-speaking parts of the world small, low, rocky islands are often referred to as "skerries". The Skerries Islands of my title are three such islands off the town of Skerries in north Co. Dublin on the Irish east coast. Indeed, the town possibly derives its name from the fact that these three skerries are located nearby, and a fourth skerry, linked to the mainland and the town by a sandy tombola or peninsula, and named locally as Red Island, is clearly part of these geological outcrops. However, it is the three true islands, and their breeding seabirds, that I am writing about in this article.

The largest of the three, and the closest to the shore, is Shenick's Island, which lies off the South Beach at Skerries. A fairly flat plateau of deep glacial drift lies over an extensive area of bedrock shales and boulders, with some gravel beaches, and at low spring tide it is possible to walk out to the island via a narrow gravel ridge. One has to be careful about being cut off by the rising tide. There is a Martello tower from the Napoleonic Wars era situated near the northern end of Shenick's Island, but otherwise not much sign of past human habitation. The main breeding seabird interest on Shenick's Island nowadays is the presence of a small Fulmar colony. This is situated on a long earthen ledge a couple of metres below the rim of the low cliff near the Martello tower. This colony appears to have been established in the mid-1980s, when six occupied nesting sites were recorded. By 2006 numbers had grown to about 40 pairs, but in 2007, possibly due to the exceptionally wet summer conditions, numbers had almost halved. Hopefully this is just a temporary setback.

There was a reasonably large gull colony on Shenick's Island in 1969 (when the first census of breeding seabirds on the Skerries Islands was carried out), with about 150 pairs of Herring Gulls, two pairs of Great Black-backed and two pairs of Lesser Black-backed Gulls nesting in the rough vegetation on top of the island, and above the tideline on the low rocks and shingle. Numbers had halved by the mid-1980s, probably due to avian botulism killing adults and chicks annually from the mid-1970s. Now there are hardly any gulls breeding on this island.

To the north of Shenick's Island, and separated from the mainland at Red Island by a 700 m wide channel with strong currents, is the small Colt Island. In 1969 this island had a large gull colony – about 420 pairs of Herring Gulls and 3-5 pairs of Great Black-backed Gulls. These numbers too had halved by the mid-1980s, and in 2007 there was a small handful (10-15 pairs) of breeding Herring Gulls and possibly 3-4 pairs of Lesser Black-backed Gulls. No other breeding seabirds have been recorded on Colt Island.

All the above suggests that the Skerries Islands have declined greatly in importance for breeding seabirds over the last three or four decades, but the situation at the third island – St. Patrick's or Church Island – considerably changes the picture to a much rosier one.

The island list about 1.5 km from the mainland, is 12 m high at the highest point, has the ruins of an ancient Christian church, and is home to Ireland's largest Cormorant colony.

No Cormorants were nesting there in 1969, nor in the mid-1980s, but in 1992 a colony of at least 35 pairs was discovered, which produced at least 70 well-grown young by mid-July. The colony appears to have been largely neglected by ornithologists for many years after its discovery, although it was known to have grown considerably based on annual long-distance inspections by telescope from Rockabill, 5 km to the ENE. The Seabird 2000 survey and census of all breeding seabirds in Ireland and Britain between 1998 and 2002 prompted a closer inspection. This was first attempted from a boat passing close to the island, and about 560 Cormorant nests were counted. While this was a very large number, it was thought that some nests were concealed by long vegetation, especially by stands of impenetrable tree mallow. In May 2004 I landed on the island with a couple of colleagues and we censused the colony very accurately: The grand total was an amazing 957 nests, making the colony the largest in Ireland and Britain. Since then we have made annual visits and the Cormorant numbers have remained very high, with >819 pairs in 2005, 1,157 in 2006 and 965 in 2007. Here I wish to thank Dr. Ciaran O'Keeffe of the National Parks & Wildlife Service and Julie Roe for assistance with these surveys and censuses, and also Sean Pierce, who first discovered the colony. Together with the Cormorant colonies on Lambay and Ireland's Eye, there are about 2,000 pairs breeding on the Dublin coast – over 40% of the entire Irish breeding population.

While Cormorants are by far the most numerous seabirds on St. Patrick's Island, there are several other seabirds breeding there. Shags, their smaller relatives, were already nesting in 1969 (five pairs) and had increased to 116 pairs by 1986. They are still nesting there, but in smaller numbers (up to 88 pairs), perhaps due to displacement by the expanding Cormorants. Herring Gulls increased from about 190 pairs in 1969 to 250-300 pairs in the mid-1980, but have since declined almost to extinction, like the Herring Gulls on Shenick's and Colt Islands. The Great Black-backed Gulls have fared better, with about 55 pairs in 1969, about 200 pairs in the mid-1980s, and close to 100 pairs now. A few Lesser Black-backed Gulls nested on the island with the other large gulls in the mid-1980s, but have abandoned it in recent years. The latest newcomer to St. Patrick's Island is the Fulmar: in 2006 eight pairs were occupying nesting ledges.

The assemblage of breeding seabirds on the Skerries Islands, along with the islands' use in winter by feeding Light-bellied Brent Geese and roosting waders, qualified the island group for designation as a Special Protection Area for birds, under the European Union's Birds Directive.

Oscar Merne retired from Ireland's National Parks & Wildlife Service in January 2004

Photos: © Oscar Merne

Top: Cormorants on the nest.

Far left: The Great Black-backed Gull.

Left: Cormorant with chicks.

Below: St. Patrick's Island, home to Ireland's largest Cormorant colony.

A Spotlight on World Environmental Matters

by Alex Kirby

Arsenic found in Drinking Water of 70 Countries

Scientists think about 140 million people, mainly in developing countries, are being poisoned by arsenic in drinking water. South and East Asia have more than half the known cases globally, though there is also contamination in China, Cambodia and Vietnam, and in parts of South America and Africa. Peter Ravenscroft, a geographer, told a London conference arsenic was a problem in 70 countries, and probably more. The poison increases rates of some cancers, including lung, bladder and skin tumours, and other lung conditions. Some effects show up decades after exposure, and scientists say one in every 10 people with high concentrations of arsenic in their water will die from it.

World's needs to grow more food

To nourish a growing human population, the world will have to produce more food over the next 50 years than it has grown during the whole of the last 10,000 years, researchers told a UN-backed sustainable development forum in Iceland. But poor farming practices and deforestation will be worsened by climate change so that soil fertility continues to deteriorate, leaving vast areas unsuitable for crops or grazing. The UN's Millennium Ecosystem Assessment classed land degradation as one of the world's greatest environmental challenges. Up to 40% of the world's agricultural land is seriously degraded, mainly by water, from flooding or poor irrigation, or by wind. The UN Food and Agriculture Organisation says 854 million people lack sufficient food for a healthy life. Between 1980 and 2000 the human population rose from 4.4bn to 6.1bn, and by 2050 it is expected to reach 9bn. Many countries are now planting biofuel crops in place of food.

Ecuador hope to be paid not to exploit oil reserves

Ecuador has offered not to exploit the oil reserves under part of the Amazonian rainforest – on condition that wealthy nations pay it $350m a year, half the estimated revenue from pumping the oil. Backers of the plan say it is a logical development of the trend towards carbon offsetting. The German and Norwegian governments are said to have expressed interest in the Ecuadorian plan. Donors would be able to pay in cash, debt relief or other indirect ways. Some conservationists support the idea, seeing it as a way to protect biodiversity, tackle climate change and also pay for development, though others remain unconvinced.

Cat faeces killing marine mammals in California

Pet owners who flush cat faeces down the toilet may be killing whales, dolphins and porpoises around the UK coast, public health experts say. A common parasite, *Toxoplasma gondii*, found in dead marine mammals, could have come from family cats, they believe. Cats are a vital link in the life cycle of the parasite, which can infect many species as part of the food chain. In California worries that cat faeces may have contributed to sea otter deaths have prompted warnings on cat litter bags. Blood samples from dead stranded cetaceans in British waters showed one in 70 harbour porpoises was infected, six of 21 common dolphins and the only hump-backed whale tested.

Antarctic ice melting faster than predicted

Antarctic ice is melting faster than predicted by the Intergovernmental Panel on Climate Change, scientists say. Chris Rapley, the outgoing head of the British Antarctic Survey, told journalists during a climate seminar in the Norwegian Arctic territory of Svalbard there were worrying signs that ice in both both Antarctica and Greenland was flowing faster towards the sea than the IPCC had predicted. He said there was little sign of more snow falling inland to compensate. Professor Rapley said it was realistic to expect a sea level rise by 2100 of closer to a meter than the IPCC's suggested 18-59 cm range. Millions of people live less than a metre above sea level, and many of the world's major cities are on the coasts.

Hole in ozone hole over Antarctica arrives early

The hole in the ozone layer over Antarctica which develops annually has appeared earlier than usual this year, the World Meteorological Organisation says. The ozone layer shields all life on Earth from ultra-violet solar rays which can cause skin cancer and cataracts, and can damage the immune system. The use of ozone-depleting chemicals has declined, but the WMO says there is no sign that the Antarctic hole is getting any smaller yet. One WMO official said it might reach the southern tip of South America this year.

Major pollution in two of China's main rivers

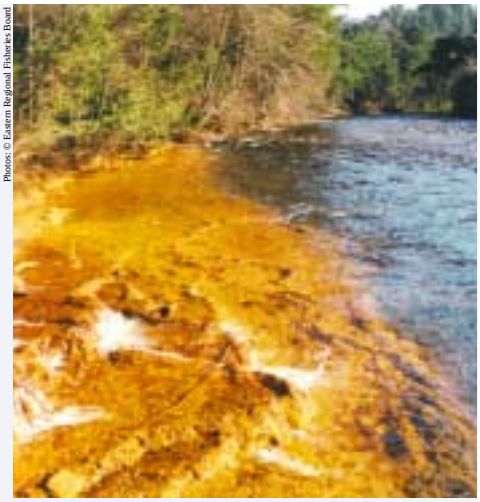
Pollution in two of China's main rivers is so bad that much of the water is a risk to the one in six Chinese who depend on it, state officials and media have revealed. They said the water was in many cases unfit to touch, let alone drink. Half the check points along the Huai river and its tributaries in central and eastern China showed water so polluted it was unfit for human contact and might not be fit even for irrigation. Despite years of efforts to clean up the Huai and Liao rivers, large volumes of untreated domestic effluent and industrial waste-water are still dumped directly into the water. The state of the Huai threatens the huge South-North Water Transfer Project, designed to take water from the Yangtze river to China's arid north.

Study suggests more male than female birds

A review of hundreds of scientific papers indicates that for the vast majority of bird species, there are more males than females. The study, published in the ornithological journal Ibis, goes on to suggest that populations of many of the world's birds at risk of extinction could be overestimated, because scientists often base population estimates on the number of males. Males are usually easier to detect, with brighter plumage than females and attractive songs. Researchers then take this as an estimate of the number of breeding pairs, assuming an equal number of males and females in the population. Dr Paul Donald of the RSPB, who carried out the review, said: "Most species have 'male-skewed' sex ratios, but a wholly unexpected finding was that the rarer the species, the more highly skewed towards males the population becomes. Therefore many of the world's rarest species may be much closer to extinction than we previously thought... One possible explanation is that many threatened species are endangered because of introduced predators, which have been shown to kill females when they are incubating eggs in the nest."

Alex Kirby is a former BBC environment correspondent.

An overview of the geology at Avoca.



Photos: © Eastern Regional Fisheries Board

Discharge coming from the mining site at Avoca.

Celtic Copper Heritage Project
RESTORING THE AVOCA RIVER

By Josie Mahon

AVOCA village in County Wicklow is located in one of the most scenic valleys of Ireland. Wicklow, the Garden of Ireland boasts famous tourist attractions such as Glendalough, Glendasan and the Meetings of the Waters. The old copper mining works at Avoca are located along the Avoca river and they operated from 1720 to 1982. This operation was an important feature of the local economy and brought employment and prosperity to the Avoca area for many years.

Today the legacy of the mining history is visible with old chimneys and engine houses in place and abandoned spoil heaps. It has also left us with a rich and diversified culture, in the differences in the landscape, in the character of the people and its incredible narrative. A negative impact of this legacy has been on the Avoca river as water flows though the shafts, adits and underground workings resulting in serious toxic contamination of the river which is known as acid mine drainage. The lower reaches of the Avoca River have been classified as the most polluted river in Ireland due to discharges from the copper mines.

The Avoca River was once a great salmon river as records prior to mining activity show. Today almost 12km the river is seriously polluted from the copper mines. It is almost devoid of fish life and the visual orange staining on the river bed is obvious for all to see.

In 2001 the Eastern Regional Fisheries Board embarked on a process to ascertain whether it would be possible to restore this fine river to its former glory as it would bring environmental, social and economic benefits for all in the community. The Board consulted with stakeholders in the area such as Wicklow County Council, Geological Survey of Ireland, Central Fisheries Board, Avoca Mining Heritage Trust and the Mining Heritage Trust of Ireland, landowners and other community groups to ascertain objectives and plans for the area. In 2002 the Board commissioned the University of Newcastle to carry out a desktop study to identify solutions for the treatment of the acid mine drainage pollution.

In October 2003, the University of Newcastle published a report which suggested that with assistance from international experts and financial investment, the Avoca River could be restored to one of the most prolific salmon rivers in the country. The solution proposed was to construct an active treatment plant which would treat the acid mine drainage discharges.

Having seen a possible solution and light at the end of the tunnel, stakeholders reinvigorated their campaign and submitted an application for funding under an EU Ireland Wales Interreg Project. In 2005, €296,820 was granted to a project known as 'Celtic Copper Heritage'.

The purpose of this project is to harness the historical copper mining heritage in Avoca in Wicklow and Amlwch in Wales as a means of generating positive economic, social, cultural and environmental benefits in both of these rural communities. More specifically it examines the positive aspects of working with the important mining heritage in Avoca, Co. Wicklow and in Amlwch, Wales where there are many similarities of the legacy of mining heritage on our environment.

The pilot treatment plant which was in place in Avoca for three months in 2006.

Within this EU project an active pilot treatment plant was commissioned in 2006. Unipure Europe Ltd, were appointed to install and run a series of trials at Avoca to establish whether it would be possible to treat acid mine drainage from the former mines into the river on a small scale and what the parameters of a full scale active treatment plant would be for the Avoca river.

This report, entitled 'Celtic Copper Heritage Project, Avoca Mines Pilot Plant Treatment Trials', was launched in by the then Minister for the Environment, Mr. Dick Roche TD in May 2007. Its findings indicated that the pilot treatment plant trials were successful in demonstrating that active treatment will reduce average total metal concentrations in the Avoca River downstream of the mines by 66% to 72%. This reduction would result in significant improvement in river water quality and the trials demonstrated that active treatment will enable the Avoca River to achieve a salmon fishery standard for all metals except zinc. One of the findings of the report is that one year's continuous dataset is required.

Dead salmon/sea trout – a regular occurrence during the smolt run at Avoca.

The estimated capital cost to build a full scale treatment plant is €3.6m (ex VAT) with an annual operational cost of €0.5m (ex VAT). Of the annual operational cost, €300,000 is required for sludge disposal.

In conclusion, restoration of the Avoca River is possible as the results of these pilot plant treatment trials have suggested. Regeneration of this rural area will ultimately raise the profile of Avoca as a tourist destination. There are many elements to the rehabilitation and long-term sustainable management of mines sites and this project is an important component of this.

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Join the Hunt for Mermaids' Purses!

Purse Search Ireland

A New Public Sightings Scheme for Shark, Skate and Ray Eggcases

By Sarah Varian

PURSE Search Ireland is a new marine environmental outreach project that is seeking input from the Irish beach going public. The aim of the project is to encourage people to report their observations of mermaids' purses, which are actually the eggcases of sharks, skates and rays. These purses are laid by the adult female fish in a suitable habitat on the seafloor, with the young embryo developing within the eggcase for up to 15 months. The baby shark or skate then hatches out of the purse and swims away, leaving the discarded eggcase behind it. Eggcases can often be seen washed up on the seashore, frequently tangled up in seaweed along the upper shoreline. Scientists are hoping that observations of mermaids' purses on the seashore (and underwater) may provide valuable information on the location of nursery areas for Ireland's skates and rays, some of which are endangered or rare.

The search for purses was launched at the Dublin Zoo Native Species Weekend in April this year, with an extremely enthusiastic response from visitors attending the workshops associated with the event. The event was made all the more interesting by the attendance of some baby sharks and rays, kindly donated to the project by The National Sea Life Centre in Bray. The tiny shark and ray embryos could also be seen inside their protective eggcases, giving people a unique opportunity to see mermaids' purses with the living occupants still inside! Since April, the Purse Search Roadshow has visited many schools around the country, including numerous biodiversity events, in an effort to raise awareness for the project. As a result of these efforts, the project has been slowly gathering a troupe of dedicated observers. Associated press and media coverage have also contributed towards increasing numbers of reports coming in from beachcombers, divers and fishers from around the country, including confirmed sightings of purses for Thornback Rays, Spotted Rays, Cuckoo Rays, Lesser Spotted Dogfish and Greater Spotted Dogfish (aka Bull Huss or Nursehound).

Photos: © Marine Dimensions

Rohan Chretien who found a Nursehound purse on Greystones Beach this year.

Improving our knowledge of nursery areas for fish species is crucial for effective fisheries management. This is particularly true for sharks, skates and rays as they are known to be a vulnerable group of fishes, their slow growth and late reproductive maturity reducing their ability to recover from intensive fishing. For example, the male Common Skate, *Raja batis*, does not mature until it is over 10 years old. In Ireland, several of our inshore skate and ray species are classified as being rare or endangered, with the Common Skate being of particular concern as it is currently classified as critically endangered by the IUCN. A previously common fish species (hence the name) in the North East Atlantic, the Common Skate is now, rather ironically, absent from the Southern and Central North Sea, the Irish Sea and most of the British coastline. Only small localised populations remain in Ireland and Scotland.

The Common Skate's large size (up to 2.9m in length) makes it particularly vulnerable to fishing and it is highly prized by recreational fishermen. In an effort to protect the animals in Ireland, the Irish Specimen Fish Committee has removed the species from listings, encouraging recreational fishers to return specimens to sea. Agreements between commercial fishers and chartered recreational fishing boat operators have also increased protection in some areas, with the return of commercial catches benefiting sea angling tourism. Indeed, long term tagging studies conducted by the Central Fisheries Board suggest that the Common Skate may be recovering in some areas, with individuals being extremely localised, returning to the same areas year after year. The cooperation of commercial fishermen with recreational fishing operators is encouraging and may well have contributed towards this positive result. With no legal protection measures in place, voluntary agreements set up by the fishing industry are obviously vital for the recovery and sustainability of this species. However, effective management of skate and ray species is still very much hampered by lack of adequate information on commercial catch returns, as skates and rays are generally only recorded as a single group by size, without any records for individual species. Therefore, improved monitoring of vulnerable species in catches is now essential in order to clarify the threat to various populations around our coasts. Enhanced protection measures could then be considered on the basis of adequate information.

Purse Search Ireland is keen to hear from anybody who may have knowledge of skate or ray nursery areas. If you would like to report a sighting, please fill out an online recording form at www.marinedimensions.ie. Eggcase samples should also be sent on to Marine Dimensions, the project organisers, so that the scientists can identify the purses to species level. The project website includes information on eggcase identification, with prizes and competitions for kids. A copy of the Seashore Code on the website emphasises the importance of safety and environmental care for beach excursions. To get in touch with a project scientist, call (01) 2828876 or e-mail admin@marinedimensions.ie. Purse Search Ireland is funded by Bord Iascaigh Mhara, Discover Science and Engineering, Forfas and the National Parks and Wildlife Service, with support from The Shark Trust. Marine Dimensions is extremely grateful to all Purse Search volunteer recorders for their time and dedicated support.

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A Lesser Spotted Dogfish eggcase, *Scyliorhinus canalicula*, washed up in Naylor's Cove, Bray, Co. Wicklow.

A Spotted Ray purse, *Raja montagui*, washed up on Carratigue Beach in north Mayo.

Still Too Much Waste Going to Landfill

By Jackie Keaney

IRELAND'S tide of waste is turning. Figures reported in the EPA National Waste Report 2005 for recycling and recovery have exceeded expectations, as well as EU and national recycling targets. Municipal waste generation per capita decreased by 0.7%, and a lower proportion of this waste is going to landfill. However, now is not the time to rest on our laurels. A more careful analysis of the report will find that the actual tonnage of municipal waste going to landfill increased in 2005, putting an end to the otherwise encouraging downward trend since 2001.

Landfill does have a role to play in Ireland's waste management system. However, it is not sustainable in the long term and is the lowest option on the international waste hierarchy of preferred waste management solutions. European and Irish waste policies aim to dramatically reduce reliance on landfill and as such have set ambitious targets for landfill diversion for as soon as 2010. To achieve this, many Member States have imposed legislation that strongly discourages the use of landfill, and are leagues ahead in achieving long-term landfill diversion targets. By contrast, municipal waste to landfill in Ireland increased in 2005 and further landfill capacity is being sought.

The Department of Environment's policy document Changing Our Ways issued in 1998 found that a reliance on landfill had limited the development of integrated waste management approaches and inhibited waste recovery and recycling options. Ireland needs to develop alternatives to landfill if it is to realise the environmental benefits of an integrated waste management system and meet diversion targets.

The elephant in the closet is the huge surplus of landfill capacity in Ireland. The Confederation of Waste to Energy Plants (CEWEP) has found that current approved landfill capacity amounts to nearly 4 million tonnes per annum even though less than 2 million tonnes per annum of waste is actually sent to landfill. With landfill capacity at more than double what is required, there is little incentive to develop alternatives.

This surplus has seen landfill gate fees drop significantly since 2005. Reduced waste charges are certainly good for competitiveness and can be met with some relief given that prices were as high as €240/tonne in 2004-5. However, landfill charges that are too low make it very difficult for alternatives such as recycling, composting and waste to energy to compete, effectively removing any incentive for landfill diversion. If this continues, Ireland will miss its diversion targets; be required to pay fines to the EU and will be stuck with an embarrassing legacy of poor waste infrastructure in the long term.

It may not come as a surprise that this overcapacity was not planned. Ireland's waste policy is implemented through Regional Waste Management Plans, which set out a strategy to meet policy objectives whilst being sympathetic to local conditions. However, CEWEP has found that local authorities have not always adhered to these plans. This seriously undermines the authority and strategy of the plans, threatening the viability of alternatives to landfill that were included in the plans to help achieve policy objectives. However, as there appears to be no State Agency monitoring landfill capacity developments, landfill capacity has been allowed to continue to expand.

Measures are needed to reverse this trend. Ireland should refer to the wealth of experience in other high performing Member States, many of whom have experienced similar problems, for effective strategies to achieve landfill diversion.

CEWEP has been involved in waste policy across the EU since 2001. From experience, landfill levies provide the best incentive for landfill diversion in a competitive waste market. This is because they provide the necessary market conditions for the development of alternative, capital-intensive waste infrastructure without immediately impacting on available disposal capacity.

Landfill levies in Ireland are currently at €15/tonne waste, which is far lower than in those Member States implementing best environmental practice. Legislation provides for a €5/tonne price increase per year, but this has not been applied since the levy was first introduced in 2002. Increasing the landfill levy would ensure that alternative waste infrastructure is competitive with landfill. Furthermore, funds raised by the levy are channelled into waste prevention and recycling in Ireland through the Environment Fund, ensuring that the overall cost of waste management to the consumer is minimised.

Landfill levies can be effectively supported by a ban on certain waste streams to landfill, in line with EU waste policy. A ban is most effectively implemented after the necessary infrastructure has been developed, and provides developers with the certainty to effectively plan for the future.

This matter needs to be addressed. Ireland has only 3 years to meet its first EU landfill diversion commitment, yet the amount of waste going to landfill is back on the increase. Developers that are looking to invest in alternative waste infrastructure need reassurance that dumping in landfills will not continue to be the cheapest, most preferred option. The legislation is there to provide this reassurance, in the form of a €5/tonne increase in the landfill levy. Ireland needs to take this opportunity to act on its over reliance on landfill before it is too late.

Jackie Keaney is Irish Vice President of CEWEP (Confederation of European Waste to Energy Plants)

Looking Back into the Future of Climate Change

The melting of the glaciers – how far will it go?

By Barrie Dale

SO you thought it was an awful summer this year, and did you worry about it being yet another example of global warming? Well, like everything else to do with climate it all depends upon your perspective.

The one thing we are certain of regarding climate is that it is changing – and it always has. This basic truth tends to be lost, or at best distorted, in the enormous daily media blitz, and unfortunately as a result, public opinion is becoming more and more polarized. On the one hand, there are a growing number of people interpreting every "unusual" turn in the weather as evidence of climate change due to human impact on the environment (as if there was no unusual weather before the industrial revolution). At the other end of the spectrum we have people who somehow find comfort in the fact that the Earth has witnessed drastically different climate before, with thousands of years of ice ages etc., so the relatively modest changes now should not be too bad!

There are several reasons why the public at large find themselves caught up in this climatic turmoil, but basically it has to do with "scientific issues". Life used to be simpler in the old days – researchers discovered things, discussed them largely with other researchers, and results dribbled out to the public to the extent there was real public interest. There were serious scientific issues that engaged the public in previous times, too, for example Darwin´s theory of evolution, but these were few and far between. Today, by contrast, the public are constantly bombarded by "issues" of all sorts, including regular doses of heavy scientific issues. These range from external threats such as meteorite impacts on Earth to internal epidemics such as bird flu, and they all share two common factors: they are life-threatening to people and they require science to understand and solve the problem. There is now a well-established triad of pressures driving these issues. The politicians, the media, and scientists are all under similar pressures – to gain, and if necessary produce public awareness concerning the issues of the day. Issues such as climate change, combining human threat and human negligence, understandably have most impact in what has become a hectic scramble for attention.

The issue of climate change has huge potential for generating public fear, sometimes bordering on hysteria, fueled by images of disappearing species and drowning coastal cities. This provides good stuff for the tabloid press and Hollywood film-makers, but underlying all this are two serious scientific facts that set climate change apart from all other issues, and guarantee that it will be the paramount issue for at least a generation to come. The most important fact is that it is surrounded by so much real uncertainty that no one is in a position to explain just what will happen; the perceived threat comes from computer-generated models that suggest a range of possible future developments, from catastrophic melting of polar ice masses to warming only on the order of that enjoyed by our ancestors around one thousand years ago in the so-called Medieval Warm period. The other distinguishing fact concerning climate change is that it will take many years (a generation?) before we/they find out what actually happened. It must be tempting for some politicians to hop on to such a popular bandwagon, knowing that whatever they say or do cannot be seriously challenged, not only until after the next election – but well into the next generation. Scientists, on the other hand, may feel they have little choice – large amounts of national research funds are earmarked for climate change, and universities and research institutions are reliant on such funding.

"If you really thought this summer was bad, pity the poor people of northern Europe when it rained almost without stopping from spring in 1315 until well into the autumn of 1322; and that was only the beginning of the Little Ice Age."

To my knowledge, no respectable scientist has predicted that all the large ice masses on earth will melt within the foreseeable future, with the catastrophic results that would cause – they simply do not know. However, when this possible threat is raised they do not necessarily focus on the uncertainties, and there may be good or possibly not so good reasons for this. The planet would benefit enormously from taking the very threat of climate change seriously – reduced pollution, more efficient use of limited resources, etc., and this poses a dilemma for science. A scientist questioning the doomsday prophets risks being typed as anything from a "capitalist" (e.g. supporter of G.W. Bush politics favouring the oil industry) to a poor scientist (everybody "knows" that a high percentage of scientists agree "there will be catastrophe!"). Science today is largely run by economists and politicians under pressure to produce quick answers to the urgent questions of society – they have

Photos: © Robbie Murphy

Wave power as alternative energy?

little sympathy or understanding for scientists who say they don't know, and quickly find others who claim they do know.

We may have to reach back hundreds of years into history to find an equivalent example of such mass fear for the well-being or even survival of our species. During the dreadful waves of bubonic plague (black death) that swept over Europe in the 1340s, killing anywhere from one third to a half of the population, people reacted with mass hysteria and processions of penitents beating their backs with weighted scourges in attempts to halt the mortal threat they did not understand. That was before the emergence of modern science with its offer of a more rational approach than mass hysteria, and it took over four hundred years before rational quarantine, disinfection, and isolation came into widespread use to combat the disease. In order to deal rationally with the present-day threat of climate change, we still need science that holds steadfast to its rational principles and a population that avoids any urge towards hysteria.

So what is a body to do, faced with all the threats and uncertainties of climate change? As a scientist working in geology, marine biology, and environmental sciences, while living in Norway at the same latitude as the southern tip of Greenland, I strongly recommend expanding your perspective beyond the daily news blitz. Not necessarily way back into geological time, though there is a certain comfort in the general understanding that this beautiful planet has seen it all before (even fossil fuel was burned off before humans). For a good start you can read a book, *The Little Ice Age, How Climate Made History 1300-1850*, by Brian Fagan, dealing with climate during the past one thousand years. Never mind the Ice Ages and timescales of hundreds of thousands of years – here you will realise that extreme, life-threatening variations of climate are not just a present-day result of the industrial revolution – we humans have survived them throughout historical times.

If you really thought this summer was bad, pity the poor people of northern Europe when it rained almost without stopping from spring in 1315 until well into the autumn of 1322; and that was only the beginning of the Little Ice Age. In fact the Little Ice Age was not just a period of cooling, but more of extremely contrasting shorter periods of cooling and warming (sometimes warmer than today) – and the worst effects on people must have been the very uncertainty of it all. Often, the adverse weather resulted in mass hunger and starvation, and the enormous death toll in the black death plagues are thought to have been at least partly due to the poor nutritional state of the population. This was in brutal contrast to the previous five hundred years, the Medieval Warm Period (around 800–1312), with generally stable weather, on average a bit warmer than the 20th Century, though with some cold years interspersed. This favourable climate allowed the Vikings to colonize Greenland, Norwegian farmers grew corn 100-200m above the present limit in the mountains, and England competed with France in wine production. Ironically, the years immediately prior to the Little Ice Age (1284-1311) had unusually warm and dry summers, only adding to the sense of despair when the climate changed so dramatically for the worst.

The list of climate-induced tragedies during the Little Ice Age is long, including massive storms and floods, in January 1362 when tens of thousands drowned in The Nederlands and Denmark, and in 1421 and 1446 when over 100,000 drowned (enormous losses, given the population size at that time). In 1588, storms did more damage to the Spanish armada than the British navy did, while a huge storm in 1694 buried 16 farms (20-30 square kilometers) under 30m of loose sand in the Culbin disaster in Scotland. The worst of the cold weather came between the 1500s and 1800s, when glaciers in many parts of the world grew for over 250 years, in some cases destroying towns. The worst human crisis in Norway happened in 1742-1743, when the glaciers reached their maximum, and extremely heavy, cold rain caused starvation and sickness killing 30,000 people. Ireland's worst disaster came in the 1840s, when a series of especially cold winters combined with diseased potato crops caused massive starvation, and two and a half million people died or emigrated from their homeland. In China and India, extremely cold and dry weather killed an estimated 14-18 million people in the 1870s. As late as the winter of 1894-95, there was thick ice on the Thames, but temperatures gradually rose on average since then, probably marking the end of The Little Ice Age (although a colleague of mine studying the details of climate change is not totally convinced it has finished – he points out that there always were periods of warmer weather between the extremes of cold).

All this raises the question that everyone needs answering, but nobody can: to what extent is the global warming of the 20th Century to present-day the natural upturn of that ever-varying climatic curve (it had to start warming up again sometime), or is it the result of increased amounts of "greenhouse gasses" such as CO2 from the burning of fossil fuels (there should be some effect)? The shift in perspective advocated here will not answer this question either, but it may help you evaluate some of the so-called "expert" information we are bombarded with. Next time you hear claims that what we are experiencing now is " the worst/biggest/most rapid", etc. change in the past X millions/thousands/hundreds of years, reflect on the complex variations seen in this albeit sketchy historic record we have of climate in just the past 1000 years. Serious measurements of climatic parameters such as temperature only cover the period of warming from the end of the Little Ice Age, and of course they do increase, and they do correspond to the burning of most of the fossil fuels – but it would be fascinating to see detailed temperature measurements, storm velocities and frequencies, rainfall, etc. covering the last thousand years.

If one could choose between a crystal ball that would see details back over in time or one that showed the future, it would be a difficult choice. On the one hand it would be illuminating to really understand in detail the climate that shaped human societies leading to where we are today – it would probably show the extent to which there was a telling effect of burning fossil fuels. But just think how fascinating it would be to see ahead to the time when the reality of today's predictions is revealed. Will future generations look back on us as we do on those who faced the Black Death in the 1300s? Will they see that we irrationally "burned away" the future climate with our fossil fuels, or will we be seen irrationally scourging ourselves with meaningless treaties that impoverished our societies with no beneficial effect on climate, because like our fellow humans in the 1300s we just did not understand. I sincerely hope they will see instead that people in the 21st Century, even without understanding all the complexities of climate change, had the common sense to use the threat of climate change as an incentive for developing a better transition to alternative forms of energy.

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Donal Golden hard at work on one of the Fish Farms.

The Golden Years of Fish Farming

By Matt Murphy

ONE of the great pioneers of Inland Fisheries in Ireland reached retirement age recently after 46 years of public service.

A native of Macroom, Co. Cork and introduced to inland fisheries by the late, great Noel Hackett. Donal Golden began his career in the Inland Fisheries Trust on 8th December 1961.

In 1962 he joined the Trust's mobile unit, as it was called. This unit travelled the country doing stock assessments in rivers and lakes, mainly through electro fishing. Donal has always said that this was a great way to get to know the fisheries around the country and recommends it for inclusion in any induction programmes for new staff of the Fisheries Boards.

In 1963 he was assigned on a temporary basis to the Trust's Fish Farm in Mullingar and spoke with pride on the fact that he produced the, never to be forgotten, figure of 506,267 trout fingerlings that year. This did not go unnoticed and by 1965 Donal was placed in charge of the Trust's main fish farm in Roscrea. In the intervening period he has increased production from 70,000 rainbows of 0.5lb and 60,000 ½oz browns in 1965 to 1.5m brown trout fry, 100,000 brown trout of 2+lbs and 300,000 rainbow trout, in 2007.

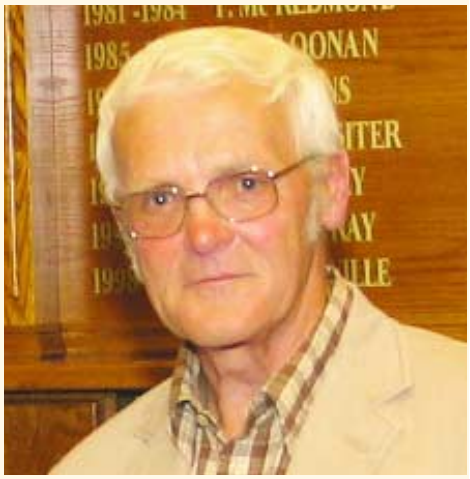
These fish are distributed to the Fisheries Boards, angling clubs and fishery owners around the country. This year in excess of 300 deliveries were made to 80 customers throughout the 32 counties. Donal's delivery trucks could be seen on the roads of Ireland six days of the week from March to September.

Of course there is no comparison between the quantity of fish required for the table and for the angler. The angler demands good quality fish with a brave, big head, an expansive tail and a well filled body. The quality of the head and tail are of little consequence to the fish farmer producing for the table.

But Donal wasn't just a fish farm manager. He was also an inventor, developing new fish farm systems and processes, a vet, he was renowned for not alone diagnosing fish health issues but for advising, or more correctly in his case, instructing vets on what medicines would or wouldn't work.

Some of Donal's skills were best illustrated through the manner with which he ran the fish farms with minimum funding within the constraints of the Public Service. Unfortunately, he could not make decisions on their merit alone, as he always had to look over his shoulder to Glasnevin and later Swords (HQ) to ensure that he was meeting all the requirements of the Civil and Public Service. There is no doubt, though, that when the history of inland fisheries is written, it will show that, more often than not, Donal made the right decisions with just a squint over his shoulder. Numerous stories and anecdotes are told and retold about how Donal ensured that all decisions taken were for the benefit of the fish farms and for the greater good of inland fisheries.

While Donal could be seen in the farm every weekend and even on Christmas Day, he had that great ability of work-life balance. Nothing was more important to Donal than his wife Noreen and family. He still claims that Noreen is a Cork woman, although there appears to be strong evidence that she was lucky enough to be born on the Kerry side of the "county bounds"! Donal was no mean footballer, having played senior football. However, he devoted a large portion of his limited free time to managing the local soccer team with whom his sons, Tim, Donal and Andrew excelled. He took particular pride in his daughter, Paula and her successes and now greatly enjoys the next generation.



Donal Golden – one of Ireland's longest serving fish farmers.

The CEO of the Central Fisheries Board, John O'Connor, is reported to have been once asked how one could manage a man like Donal who always appeared to buck the system and do his own thing, and, to have responded that Donal was a man apart, a great Public Servant and if he had listened and toed the line he wouldn't have been the successful manager he was and the angling fraternity wouldn't have had the consistent quality fish that they had for over 40 years.

His likes won't come again.

Matt Murphy, Sherkin Island Marine Station, Sherkin Island, Co. Cork.

International Year of Planet Earth

planetearth Earth Sciences for Society 2008

By Enda Gallagher

THE United Nations has decided that 2008 should be International Year of Planet Earth (IYPE). Ireland fully supported the decision and the Geological Survey of Ireland (GSI) and various partners are now planning a series of events to make IYPE a success in this country.

Planet Earth and issues that relate to it such as climate change, the environment, sustainability etc are now receiving substantial press coverage and are of interest to growing numbers of people. GSI has seen this trend evolve and believes that IYPE is a unique opportunity to promote the contribution that Geoscience makes to society. Geoscience is all about understanding our earth and how it was formed. Such knowledge is now essential in helping us deal with some of the environmental and sustainability challenges facing our planet as a result of ongoing human activity and development.

GSI believes that IYPE will achieve widespread support from the general public as we begin to publicise and promote our plans. GSI has been planning Ireland's programme of events for several months now with an enthusiastic National Committee and a squad of Regional Co-ordinators across the island, north and south. Indeed a special pre-launch information event aimed primarily at the geoscience community will take place in GSI offices on November 1st of this year to inspire interest in IYPE and encourage the development of additional activities.

Why is IYPE important?

The National Committee for IYPE is optimistic that successful management of the IYPE programme in Ireland will have the following benefits:

- Ireland will play a leading role in an important UN initiative, in keeping with our long tradition of achievement and innovation;
- An improved public understanding of geoscience will ensure that geoscience issues will be properly debated;
- Research centres of excellence will develop in order to house increasing numbers of geoscience researchers attracted by this more informed knowledge of geoscience;
- This increasing number of geoscience students and researchers will contribute to Ireland's plans for a "knowledge economy";
- GSI expects increased use of its data, products and services, as the public become more aware of the potential contributions of geoscience.

Photos: © GSI

Children attend Groundwater Festival in GSI office, Dublin.

Discovering rocks in north Mayo geology field trip.

Dunluce Castle, Co. Antrim.

Programme of Events

The National Committee is devising a series of attractive events, including a series of public lectures, Planet Earth Walks & Talks, a Planet Earth TV series, schools competitions, conference exhibits and much, much more, all underpinned by the publication of attractive brochures and a website (see details below). You will hear about events through publicity and media activity. The website will host a continually updating Calendar of Events and a newsletter will also be published as appropriate (the first issue has already been published).

The formal launch of the IYPE year-long programme by Mr. Eamon Ryan, TD, Minister for Communications, Energy and Natural Resources will take place in Dublin Castle on January 18th 2008. It will coincide with the first of the Planet Earth Public Lectures. This is to be delivered by the famous English zoologist and broadcaster, Professor Aubrey Manning, from the University of Edinburgh. His research interests cover animal behaviour, development and evolution and he has long been involved in environmental issues. His television series have included "Seven Wonders of the Earth" and "Earth Story." His talk, provisionally entitled "Nurturing the future of our Planet," will deal with the expected course of climate change and environmental evolution, and how our behaviour (and that of geoscience) can impact on both of them.

IYPE is being developed on an all-island basis. The island of Ireland is home to a wide range of spectacular landscapes from the incredible basalt columns of the Giant's Causeway to the magnificent limestone pavements of the Burren, both locations well known throughout the world. IYPE activities will be spread right across the island with local groups everywhere planning events right on your own doorstep.

Field trip at Ceigh fields, Co Mayo.

IYPE Website

The IYPE website for Ireland www.planetearth.ie is currently live with introductory content. As we approach 2008 additional content will be added including news, photographs, programme of events updates, educational materials etc. The website will become the leading resource for those interested in regularly finding out more about IYPE. In particular the site will focus on reaching out to the general public and the education sector. Please visit the site often, but for now please do not expect too much!

For any further details on IYPE or if you would like to be invited to either the launch or the information event mentioned in the article, please contact Enda Gallagher at GSI – 01 6782834 or enda.gallagher@gsi.ie.

Enda Gallagher, Geological Survey of Ireland, Beggars Bush, Haddington Road, Dublin 4. www.gsi.ie www.planetearth.ie

The Last Voyage North

Photos: © John Gore-Grimes

By John Gore Grimes

AFTER eleven voyages north of the Arctic Circle and one south of the Antarctic Circle, the time has come to hang up the sea boots and to live off memories rather than experiences. In 2006 we sailed the *Arctic Fern*, a 44ft sloop, from Howth to the Faeroes for a final visit to Brendansvik and to revisit the place where Brendan the Navigator called in about 580 AD". Brendan and the brothers had dropped in to see Paul The Hermit on Rockall as they passed that way. Paul was 150 years old when Brendan met him. Sailing on from Rockall to the Faeroes the brothers came upon a small rock island. They were hungry and the brothers suggested to the Abbot that they should light a fire there and cook the porridge. Abbot Brendan agreed. They landed on the rock island, lit the fire and put the pot upon it. Before the porridge was cooked Abbot Brendan said: *"Brothers I think its time to leave this island"*.

The brothers were still hungry and asked Abbot Brendan to wait at least until the porridge was done. Abbot Brendan said: *"We should leave this island now, without putting out the fire because the island is starting to submerge"*

With that Abbot Brendan and the brothers leapt from the island and settled into their Curragh just as the fire beneath the porridge pot was extinguished by the sea. They had landed on the back of a whale and the brothers named the whale Jasconius.

We sailed north from the Faeroes to Svalbard. At the seventieth parallel I looked into my old '1980' logbook to see how we were doing at that time. In the summer of 1980 we were on the Svalbard in *Shardana II*, a Nicholson 31. There were six crew aboard and we had stocked up in Lerwick. No provisions were available in Spitsbergen and our next provisioning port would be Howth. We would not need any stores by the time we got back to Howth. It was much colder then. Our feet and hands were cold and, without furling gear, the headsails were frequently changed. We carried five headsails. Work at the mast was cold and sometimes painful. There was more counting then. Counting the pips of Radio Colorado's time checks. Counting and noting the figures from the sextant and then delving into a sea of numbers in the almanac. Checking the mileage on the Walker log and crossing the morning fix with the afternoon fix. Calculating the observed position and moving from one observed position to the next. Waiting again for the sun to come out and counting the time when one could finally get into the bunk.

In 2006, the boat is always dry and warm. We sleep under duvets. The guess work is gone out of navigation and there is a well stocked supermarket in Longyearbyen with trolleys and all. Most significantly, it is not cold in 2006.

A fulmar flew straight into the mainsail. He fell down on the deck and jumped over the side. Pilot Roche cooked monkfish and pineapple for dinner and it rained and rained. Oliver was a little grumpy when he came on watch. After the rain the fog rolled in and we kept an eye on the radar. We were in a very empty ocean but there is an impressive statistic which records that in 1898 there were two cars registered in the State of Ohio. They collided.

We left Longyearbyen at 13.08 on Sunday. It was a damp afternoon and we rounded some nasty rocks off Daudmannsodden which peered at us through the thick drifting fog with a 'come hither' look. Perhaps some hapless bluejackets came to grief when they passed too close, thus giving that 'odden' its mournful name. Then we were into Forlandsundet with nothing to see but drifting mist. The dramatic Prins Karls Forland was to port and the remarkable glaciers of Oscar II Land were to starboard but all were well wrapped up and quite invisible. Ahead were the narrows of Forlandsrevet which we cleared just after midnight with no more than a meter under our keel.

The ice in the glaciers of Isfjord has retreated noticeably but as we passed the glaciers of James I Land and Albert Land the fog cleared and there appeared to be many glaciers with spectacular amounts of solid ice running down to the waters edge. We turned into Magdalenafjord which I had not seen since 1980. The change there is startling. The Hanging glacier no longer hangs and it does not come close to the water. The Waggonway glacier is hugely diminished and the entire mountain landscape is left with just small patches of snow and ice on it. The splendour of Magdalenafjord is curtailed.

We were soon north of 80°N. In 2003 our GPS had failed as we approached Ostrov Viktoriya at 80° 09'N. The satellites have improved and, on this occasion, the GPS was in good order at our farthest north at 81°15'49''N. We came into open drift ice at 81°N and although it closed in it was quite navigable all the way. The wind was the problem. It blew from the northwest and loose ice drifted away from the polar ice cap to the southeast. The arctic winds are fickle and if the direction changed to anything between east or west of south, the open ice would compact and come right back on top of us. That is what happened in 1998 and it took five days to break free.

Mark, Oliver and I swam at our furthest north. The swim, as usual, was a cold, shrivelling affair. We could have pressed on to the polar ice front which, according to our ice chart of three days before, was at 81°42'N, but the chance of a wind shift dissuaded us.

The ice in the Arctic Ocean is shrinking and, at least, one-seventh of the average ice cover has melted since 1986. Nevertheless, the remaining ice is much thinner. When seen from satellite it looks as if it is filled with holes. In fact these are just pools of water lying on the surface. Nuclear submarines now find many more places to surface from under the arctic ice and that is a direct result of the melt. All in all the melt is expected to proceed at an accelerating pace. The east Greenland ice is a menacing challenge. As the permafrost retreats deeper into the earth and running water flows beneath the glaciers, what was once unshakeable becomes quaggy. The process hastens the inevitable and unstoppable march of the land ice towards the ocean.

We sailed back to Longyearbyen and provisioned there. We left on the 23rd July bound for Cape Tobin and the barren Greenlandic settlement which is Ittoqqortoormiit- "A place where there are many houses".

Very little happened as we dropped down the first five latitudes from 78°N to 73°N. We passed quickly across the spider-web longitudes, moving from 15°36'E, through Greenwich and on to 12°27'W.

The ice looked solid to the west and southwest as we tried to skirt around it with plenty of east and southeast heading. As we rounded a corner with high ice to starboard we suddenly saw a polar bear standing on a flow. We did not approach him but rather we drifted slowly and quietly by. The bear was not alarmed. He stamped about on the ice for awhile and then sniffed the water before jumping in. He swam disdainfully with his black toffee-nose held proudly above the water. It was a real privilege to see this astonishing animal in the arctic. This bear was 150 miles off shore.

Pressing or pushing through ice is laborious and disheartening. The unimaginative triumph in ice because they cannot see or feel the peril. For many years I ploughed on merrily with about as little care as a tightrope walker on the wire one foot above the ground. We were bold and carefree trespassers. Today, the words horror, panic and dread would come close to describing my involuntary feelings in ice. I have not suddenly become imaginative but I have become more familiar with this erratic and perilous

Arctic glacial ice is retreating fast in Svalbard and in Greenland.

environment. I am seduced by its beauty. I am intimidated by its energy and its potential to do serious damage at very short notice.

As we round Cape Tobin the fog lifts and we are in Scoresby Sund. We anchor at Ittoqqortoormiit on Saturday 24th July at 12.46.

The Greenlanders had fired at us with rifle shots in 1985 on our arrival but, on this occasion, two narwhals had been driven in to the shore from the bay by a fleet of a dozen or so big-engined speed boats. The narwhals are eventually killed by rifle shot but it seemed to take a long time. Adrienne, Mark and Oliver row ashore to get a closer look. A lot of bullets are needed to dispatch the narwhal but the Greenland hunters are clearly doing their best not to prolong the whales' agony. The dead narwhals are towed to a large ice floe nearby. They are hauled up on the ice with ropes and flensed with razor-sharp uluks. The entire process of finding the narwhals in Scoresby Sund and driving them back inshore where they are shot, together with the process of flensing and carefully dividing the shares in accordance with longstanding rules of village tradition, takes between seven and eight hours.

We heaved up at midday on Monday 31st July with seven bells of wind racing down from the hills above Ittoqqortoormiit

Our fortunes were mixed over the next three days. There was fog for a time but, for the main part, visibility was clear as we passed by a bleak and desolate shoreline. The ice troubled us and Pilot Roche spent long hours perched on the second crosstrees. Then the whales came by. They stayed with us for just over an hour. There were about ten to fifteen whales swimming, blowing and diving close to the boat. These were Sei whales or as you and I would know them, they were the *Balaenoftera borealis*.

The wind picked up and when we re-crossed the arctic circle, we had been north of it for 23 days. We were back into some hours of darkness with heavy dark cloud cover which emptied its cold watery contents on us. A fresh wind blew from the south. There was plenty of high-sided, jagged ice about and all of it had recently been dumped into the ocean from Greenland's shore.

If the Greenland ice cap melts completely, the consequent worldwide rise in tidal levels will be forty feet. If the same thing happens in Antarctica, high water will be another forty feet higher.

It may be coming close to the time when you should measure how high your home is above high water. If it is ninety feet or less you must advise your grandchildren to build their homes further up the hill.

These large, jagged ice floes moved at about 2.5 knots with the wind. We peered into the gloom towards the southwest and there was a lead. We headed for it listening to the growlers thumping along the underwater hull. Then the lead closed as pieces of ice crashed to form an impassable barrier. We looked astern but the way out had suddenly been blocked by another ice pile-up. The ice did an ugly dance on the ocean surface. Its ponderous rhythm was unpredictable. A new lead opened to the west. We took it. The important thing, in these conditions, is to keep moving for as long as you can. If you are forced to stop you will receive a hammering. This ice was no longer whispering caveats. It was in full battle-cry. West was not a good course and there was no sign of a water corridor that way. We used the bow-thruster to turn the boat quickly towards the south. We were head to wind and these ice mounds, which may have enjoyed thousands of years of relative ataraxia in the slow moving glaciers, were making the best of their recent deliverance from the monotony of their former lodgings. They came straight at us.

It took five hours to clear that ice. We hoisted the mainsail and unfurled the genoa. We started beating our way towards Reykjavik in a windy rainstorm. Later the conditions improved. The wind veered to give us a fast reach to the marina in Reykjavik harbour.

We sailed home from Iceland stopping in the Westman Islands, the Faeroes, the Shetlands and in various ports between Cape Wrath and Ailsa Craig and tied up in Howth on 29th August. We had travelled 5,055 nautical miles in 59 days.

John Gore-Grimes, Cavendish House, Smithfield, Dublin 7.

Photos: © John Gore-Grimes

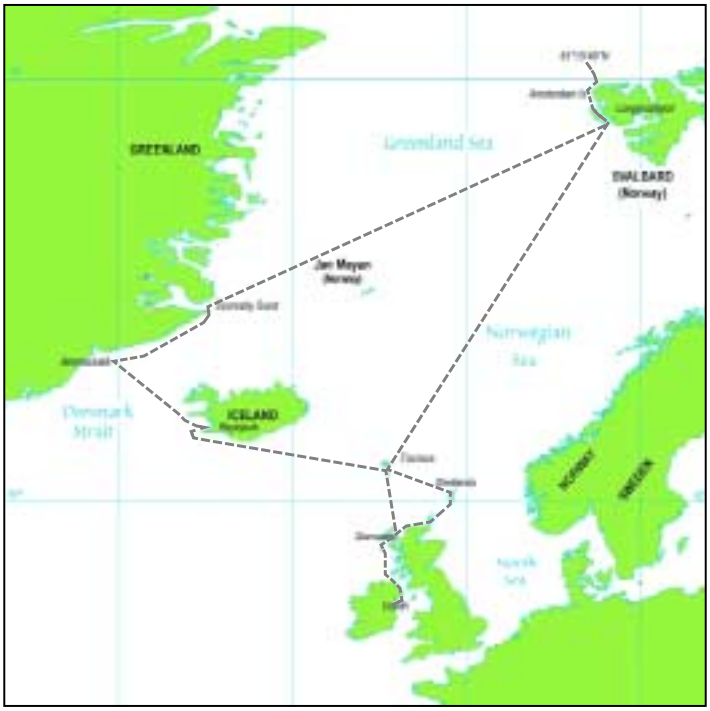
Clockwise from above:

The 'Hanging Glacier' at Magdalenafjord.

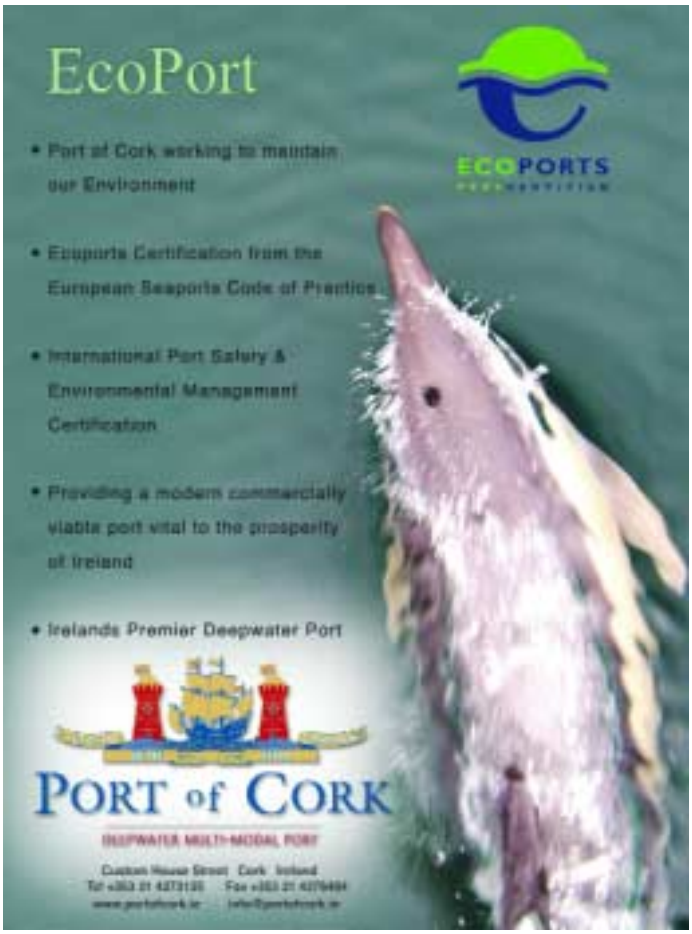
A 100 metre high west Greenland berg.

The Chapel at Brendansvik.

***Arctic Fern* in Isafjord Spitsbergin.**



The 2006 *Arctic Fern* voyage.



The Great Stone Castles by the Anglo-Normans

Roche Castle, Co Louth

Did castles exist in Ireland before the arrival of the Normans?

When we think of the word castle, what image immediately springs to mind? For most people the image would consist of different elements: turrets, towers, battlements, drawbridge, moat etc. But the one element of a castle that everyone would agree on is, in fact, the most obvious – STONE!! In Ireland stone castles are associated solely with the arrival of the Anglo-Normans. But this does not mean that there were no castles in Ireland before the Norman Invasion of 1169. Referred to in contemporary sources like the Irish Annals as Dún or Rath , early Irish 'castles' were probably constructed from wood and we know that at least seven existed: at Ballinasloe, Galway, Collooney, Athlone, Cuileanntrach, Tuam and Ferns. These native Irish 'castles' were mainly built in the twelfth century between c.1124 and 1166. However, it was only after 1169 that the term Caíslen is regularly used in contemporary sources and it was applied specifically to a new type of construction: the castles being built by the Anglo-Normans.

The invaders arrive!

The arrival of the Normans wrought a distinct change to the Irish landscape. Almost immediately the invaders began to busy themselves encastellating those parts of Ireland that they conquered. First came the motte and bailey castles, (Professor Terry Barry from Trinity College, Dublin, states that a motte can best be described as a mound of earth, usually artificially raised, with a fosse or ditch at its base), which to this day dot the country, like Dunsilly in County Antrim. But the invaders also left a more enduring symbol of the Norman overlordship of Ireland – the great stone castles, which today still dominate the areas in which they were built.

The purpose of a castle

The castle in the medieval period had a dual purpose: it acted as both residence and fortress. This idea of a construction that acted as a seriously fortified residence of a lord went hand and hand with feudalism and was an integral part of the Norman penetration into Ireland. The castle fulfilled many functions: it allowed for the defeat of local opposition and the securing of the conquered region; this in turn would help ensure the settlement would be permanent; the castle also reflected the importance of the lord and was proof of both his military and political power. Thus, the castle fulfilled a military, social, economic and political role: however its main purpose was to maintain a lordship in times of both war and peace.

Three great Norman castles built in Ireland

Trim Castle

Throughout Ireland there are numerous examples of Norman stone castles. One of the earliest (and largest) of the Anglo-Norman stone fortresses is Trim Castle, located about twenty-eight miles northwest of Dublin in County Meath. It began as a ringwork castle, built by Hugh de Lacy to protect his lordship. The Song of Dermot and the Earl, an anonymous medieval poem written about the Anglo-Norman Invasion of Ireland, refers to Trim as the first castle built in Ireland, constructed from earth and timber. The original ring-work castle was destroyed by fire in 1174 and the construction of the magnificent stone keep (which was built in three phases) began in 1175 and was continued after Hugh's death in 1186 by his son Walter. The final phase was begun c.1202. From the mid- thirteenth century onwards, alterations were made and structures were added to the outside of the keep and the curtain walls. As time went on the nature of Trim Castle changed from a heavily defended stone fortress to a spacious residential building – in fact, in the fifteenth and sixteenth centuries, the great hall in Trim was actually used for meetings of parliament!

Photos: © Alison Lennon

Trim Castle, Co Meath

The keep at Trim Castle

Roscommon Castle

There were three great castles built in Connacht: Roscommon, Athlone and Rinndown and they were all strategically sited to defend the western perimeter of Anglo-Norman lordship from the native Irish. The settlement of Connacht was the last part of Ireland settled by the Normans and this colony was not as successful as those in Leinster or the southeast. Roscommon was built to defend an important urban centre beside a medieval lake. It is a rectangular castle with large round towers at each corner – it has the largest gatehouse in Ireland, which encompasses two D shaped towers and was situated in the middle of the east wall. The gatehouse also encompassed the keep – it was three stories high and contained the principle room. Roscommon was the greatest military castle of the high middle ages in Ireland – it was started 1269 by Robert de Ufford, the Justiciar, who was looking for a strong defensive site to build a castle which would overawe Connacht and the presence of lake (called 'Lochanen') was an ideal defensive barrier to the west. Like so many castles built in Ireland in this period, it was built on church land, in this case land belonging to the priory of Coman at Roscommon. In 1280 the Justiciar of Ireland spent £3000 on repairing Roscommon, Athlone and Rinndown – a lot of material used to rebuild the castles came from Dublin and had to travel over land. All construction took place in a period when the lordship was under extreme threat from native Irish.

Roche Castle

Roche Castle is known in the old records as 'Castellum de Rupe 'or de la Roche – the Castle of the Rocks. Few buildings so vividly evoke the establishment of Anglo-Norman military power in Ireland as Castle Roche. It stands on the Louth-Armagh border and is accessible from the road south of the Drumbilla crossroads. This little known castle is among the most spectacular in Ireland, crowning a rocky outcrop in the hills north of Dundalk. An early contemporary reference to the castle states 'Rohesia de Verdun, having fortified a castle in her own land against the Irish, which none of her predecessors had been able to do.' From this entry we can gather that Rohesia was an able and determined character – after all she is the only female in medieval Ireland to be attributed with the building of a castle. A story about the building of Roche Castle survives to this day and reinforces the idea of Rohesia as a lady to be reckoned with. Tradition has it that when the castle was complete, Rohesia had the architect thrown from one of its windows in the northern tower to preserve the secrets of the design of the castle. Although there is no historical record of this event, it served its purpose in cementing Rohesia's reputation as a formidable woman. The castle is almost cliff-like on three of its sides. It was built in a strong defensive position, sited on a large rock outcrop, which drops dramatically on all sides but the east. On this side a ditch has been cut through the bedrock and the entrance to the castle is across this ditch and through an imposing entrance, flanked by half-round towers, which are the remains of what was originally a massive gate-building. A battlement curtain wall, with two massive circular bastions, flanks the entrance to the eastside. Roche Castle is essentially one great walled enclosure, roughly triangular in shape, as dictated by the irregular form of the hill and bounded by high curtain walls with battlemented wall-walks. Roche Castle was obviously built on sites chosen for strategic reasons, mainly for their defensive capabilities. The fact that Louth was a frontier territory meant that it was ripe for frequent attack by Irish lords such as O'Reilly, MacMahon, O'Donnell and O'Neill. As such it required strong defensive castles to allow the Anglo-Normans to protect their lordship. Roche Castle was obviously built with this in mind.

The ingenuity of the Normans

From the above it is fairly obvious that the Norman invaders left Ireland an amazing legacy: magnificent stone castles that still overawe the landscape. Remember these castles were built long before the arrival of any modern technology. There were no cranes for lifting the huge amount of stone required to build these castles, no lorries to bring the stone to the site of the castle, no scaffolding, no bulldozers, and no diggers. What was available in large supply were determination, ingenuity and tremendous manual labour. These castles were built to the highest standard and this is confirmed by the fact that they remain on the landscape, albeit in various states of repair, hundreds of years later. All our stone castles stand as testaments to the great archaeological achievements imposed on the Irish landscape by the Norman conquerors. They also stand as confirmation of the ingenuity of the Norman architects who took advantage of the natural landscape to build strong imposing castles in naturally defensive positions. There is one way that we can repay the debt we owe to the Normans for the gift of these wonderful castles: by visiting, exploring and learning more about them – after all, they are an integral part of our history!

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Words and Images courtesy of Alison Lennon, Department of Medieval History, Trinity College, Dublin

From the ENFO leaflet "The Great Stone Castles by the Anglo-Normans". ENFO – The Environmental Information Service,17 St Andrew Street, Dublin 2, Ireland. Tel: (01) 8883911 (01) 8883933Fax: (01) 888 3946 e-mail: info@enfo.ie web site: http://www.enfo.ie.

Ireland's precious wetland flowers

By John Akeroyd

WATER is a defining image of Ireland, with its moist Atlantic climate and famous lakes and rivers. Nevertheless, freshwater habitats are under threat in here, as they are everywhere in the modern world. All are susceptible to drainage and pollution, or invasion by alien species. Over-enrichment by nutrients is as much a problem as damage by industrial effluent. These habitats include a wide range of water-bodies, still or flowing: lakes, ponds, rivers, streams, bogs, fens, marshes and damp fields.

Lakes and ponds are almost always good places to look for interesting wild flowers. The plants that live in them are may be free-floating, rooted in the mud but with floating leaves, or growing on or near the edge. The most familiar free-floaters are the duckweeds (*Lemna*), each tiny, oval green individual not a leaf but a complete plant, yet forming huge masses that can cover still waters. Another free-floater is the little waterfern *Azolla*, an introduced plant fast becoming a pest in Ireland, with small feathery fronds that turn an attractive pink, especially in autumn, and can smother a pond surface, excluding light from other plants and animals.

Of the plants that root in the mud and have floating leaves, the most familiar is White Water-lily *(Nymphaea alba)*, Ireland's largest wild flower and especially a feature of little mountain lakes in the west. The blades of all the long-stalked leaves, an attractive bronze colour when young, float on the surface, whereas those of the related Yellow Water-lily *(Nuphar lutea)* either float or remain submerged and rather cabbage-like. This species is more a plant of the margins of rivers, although it also occurs in lakes. Water-lilies do not tolerate pollution but they can be remarkably persistent if undisturbed. On Sherkin Island, a study of the pollen grains preserved in mud at the bottom of Lake Ordree revealed that White Water-lily had grown there continually since the ice-cap in the Cork-Kerry highlands retreated and melted 10,000 years ago. The plants still flourish.

Marsh Bird's-foot Trefoil *(Lotus uliginosus)*

Common Cotton-grass *(Eriophorum angustifolium)*

Plants of rivers and streams too show similar variation in growth habit from floating to rooting in mud, although strong water movement rarely favours floating plants. An exception is Stream Water-crowfoot *(Ranunculus penicillatus)*, one of a group of white-flowered water buttercups that are a feature of Irish rivers and streams in early summer, their long stems and finely dissected leaves flowing and waving like fine green tresses in the current. A few floating leaves and air-filled spongy stems keep the plant afloat and allow hundreds of flowers to emerge and attract pollinating insects. Another plant that lives in flowing water, but always shallow and slow-moving, is Water-cress *(Rorippa nasturtium-aquaticum)*, which forms patches along streams and ditches.

Marshes can be anything from a poorly drained pasture to a river-margin or wet valley. Where there is standing water, peat accumulates and fen develops. Dominated by grasses, sedges and rushes, marshes are home to numerous water-loving wild flowers. Three of them are among the handsomest Irish plants: Yellow Flag *(Iris pseudacorus)*, which forms yellow-flowered, sword-leaved thickets in mid-summer, Marsh Bird's-foot Trefoil *(Lotus uliginosus)*, with orange-yellow pea-flowers, and Purple Loosestrife *(Lythrum salicaria)* which colours the landscape in late summer. Water Mint *(Mentha aquatica)*, richly scents wet places when trampled. With these one frequently finds Branched Bur-reed *(Sparganium erectum)* its candelabra-like stems bearing pom-pom flowers and fruits. Another attractive marsh plant is palest lilac-flowered Lady's Smock *(Cardamine pratensis)*, which can grow anywhere from reed-beds to damp lawns, flowering from April to June. It often grows alongside Ragged Robin *(Lychnis flos-cuculi)*, a more robust plant with deeply cut purplish-pink petals. In wetter places Water Forget-me-not *(Myosotis scorpioides)* makes bright splashes of blue. In and around shallow pools, where fen or marsh grades into bog, grows Marsh Cinquefoil *(Potentilla palustris)*, an often overlooked but distinctive plant with compound leaves, erect branched stems and wine-coloured flowers.

Bogs are perhaps Ireland's best-known habitat. High rainfall makes them grow, as the dead remains of moss (species of bog-moss or *Sphagnum*) and other specialized plants accumulate as waterlogged peaty hummocks. Unlike in fens, the peat becomes increasingly acid or lime-free, and soil micro-organisms such as bacteria and fungi cannot decompose and recycle the plant remains, so the mass of material slowly builds up. Raised bogs form on more or less level ground as wet plant material builds into a dome; valley bogs are kept wet by flowing water in stream valleys or around springs; and blanket bog spreads across whole landscapes, even up slopes and over hills, in western Ireland. Fluffy, white Common Cotton-grass *(Eriophorum angustifolium)* is one of the most distinctive bog plants.

Photos: © Robbie Murphy

Water Mint *(Mentha aquatica)*

Perhaps the most colourful is Bog Asphodel *(Narthecium ossifragum)*, a miniature yellow-flowered lily with small, iris-like leaves. Farmers used to fear this plant as the "Bone Breaker", thinking that feeding on it would weaken the bones of their stock – in fact the bog itself, so poor in plant nutrients, was to blame for any calcium deficiency and weak bones in grazing animals.

Dr John Akeroyd is a botanist, conservationist and writer, and Editor of 'The Wild plants of Sherkin, Cape Clear and adjacent islands of West Cork' (1996).

Memories of Summer

Water-loving Wild Flowers

Photography by Robbie Murphy

Read John Akeroyd's article on "Ireland's precious wetland flowers" page 15 to learn more about these water-loving wildflowers

White Water-lily (*Nymphaea alba*) is Ireland's largest wild flower and a feature of mountain lakes and peaty pools in the west.

Bog Asphodel (*Narthecium ossifragum*), a miniature yellow-flowered lily, is one of the most characteristic and colourful plants of Irish bogs.

Water Forget-me-not (*Myosotis scorpioides*) is one of the most attractive wild flowers of the wetter parts of marshy fields.

Branched Bur-reed (*Sparganium erectum*), a plant of marshes and pool margins, has candelabra-like stems and pom-pom flowers (the larger ones female) and fruits.

Ragged Robin (*Lychnis flos-cuculi*), with its distinctive, deep-cut purplish petals, colours damp meadows and stream-sides in early summer.

Photos: © Robbie Murphy

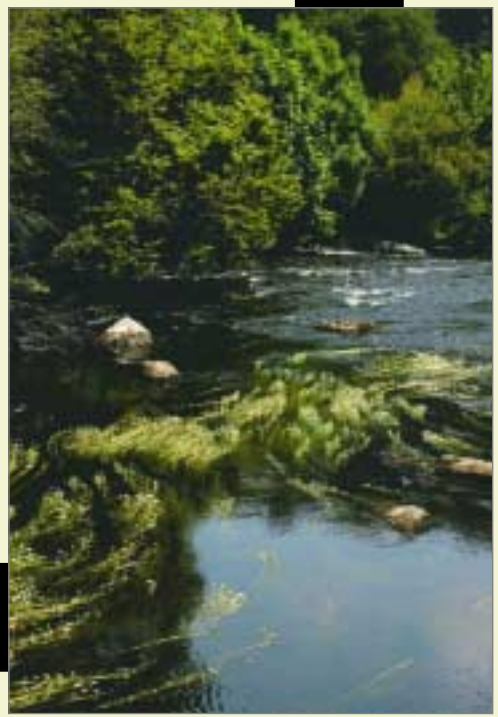
Yellow Flag (*Iris pseudacorus*), bearing its stately yellow flowers in mid-summer, is one of the best-known of all Irish wild flowers.

Purple Loosestrife (*Lythrum salicaria*), which forms great patches in damp places and beside streams and rivers, can colour the landscape in late summer.

Marsh Cinquefoil (*Potentilla palustris*), often overlooked but distinctive for its wine-coloured flowers, grows in and around shallow pools.

Water-cress (*Rorippa nasturtium-aquaticum*), forms extensive patches in shallow, slow-flowing water of streams, roadside runnels and ditches.

Lady's Smock (*Cardamine pratensis*), another wild cress, produces its clusters of fragile, elegant flowers from Easter to early summer.



Stream Water-crowfoot (*Ranunculus penicillatus*), a white-flowered buttercup with long, finely divided leaves, adorns Irish rivers and streams in early summer.

SHARK

Attack in Irish Waters?

By Declan T.G. Quigley

SHARK attack is a potential hazard that must be acknowledged by anyone that frequents marine waters (including some freshwater habitats in certain parts of the world), but it should be kept in perspective. In the USA, the *International Shark Attack File* (ISAF) compared the annual average number of human fatalities (during the 1990s) resulting from shark attacks (0.4) to vehicular collisions with deer (130), attacks by dogs (18), snakes (15) and mountain lions (0.6). Indeed, in 2000, there were only 23 'shark attacks' (with no fatalities) on the estimated 264 million people who entered the water at 68 beaches monitored by the *US Lifesaving Association* (~1/11.5 million chance of being attacked by a shark; ~0/264 million chance of fatality from shark attack). In contrast, over the same period, there were 132 fatalities at the same beaches due to drowning or other beach-related accidents (i.e. ~1/3.5 million chance of fatality from drowning and other beach-related accidents). Worldwide, it is estimated that on average 75-100 shark attacks occur annually, of which 10-15 may be fatal.

Although at least 500 species of shark have so far been described, <10% of them have been implicated in attacks on man. Indeed, between 1580 and 2006, the vast majority of attacks (55.3%) and associated fatalities (84.4%) have been attributed to only three species of shark: White Shark *(Carcharodon carcharias)* – 34.7 (46.7) %, Tiger Shark *(Galeocerdo cuvier)* – 11.7 (20.7) % and Bull Shark *(Carcharhinus leucas)* – 8.9 (17.0) %.

At least 39 species of shark have been recorded from Irish waters to date. However, most (21) of these species appear to be confined to relatively deep (>200m) offshore waters with only 7 species found exclusively in shallow (<200m) inshore waters (11 species are found in both inshore and offshore waters). Some offshore species are known to frequent upper and meso-pelagic depths, particularly during night-time feeding forays (e.g. Little Sleeper Shark *Somniosus rostratus*), while others appear to undertake seasonal inshore migrations for breeding purposes (e.g. Sixgill Shark *Hexanchus griseus*).

The vast majority of shark species found in Irish waters are relatively small (<1.5m T.L.) and harmless unless provoked or handled carelessly. For example, an otherwise sluggish and inoffensive Lesser Spotted Dogfish (*Scyliorhinus canicula*), measuring <0.8m, was reported to have bitten an angler on the nose while fishing off Folkestone (Kent, UK) during May 2007 and another specimen, measuring <1.0m, was reported to have attacked a diver in Olso Fjord (Norway) during July 2007 !! Nevertheless, a significant number of relatively large and potentially dangerous sharks have been recorded from Irish (9) and other European Atlantic waters (24) – Table 1.

White Shark *(Carcharodon carcharius)*

Over the years, there have been numerous claims about the possible occurrence of White Sharks in British inshore waters, none of which have been verified by the examination of the body by a competent authority. Those which have been examined carefully were usually revealed to be Porbeagle Shark *(Lamna nasus)*, a closely related species. White Sharks can weigh up to 3400 kg and measure 6.4m and have been responsible for 430 attacks on humans (including 63 fatalities), albeit none in European Atlantic waters.

The White Shark is a highly migratory and very wide-ranging species throughout most of the world's oceans, and since it exhibits one of the greatest geographic ranges of any known species of fish, occurring in very shallow inshore waters to the open ocean, and from cool temperate to tropical regions, it would not be surprising if the species turned up in Irish or other Northern European waters (with or without the potential influence of so called "*Global Warming*"). Indeed, there are four authenticated records of its occurrence from the Bay of Biscay:

Saintonge	1554	
La Rochelle	1872	4.21m, 1700kg
Charente-Inferieure	March, 1880	
40° 03'N, 01° 17'W	24.05.1977	2.10m, 110kg, 15m depth

The White Shark does not appear to be adverse to the colder waters of the NW Atlantic. For example, there is an anecdotal reference to a fatal attack on the occupants of a skin boat off Greenland during 1776 and three authenticated non-fatal attacks on boats off Canada (Halifax, N.S., August 1891; Bay of Fundy, July 1932; and Cape Breton Island, N.S., July 1953).

Tiger Shark *(Galeocerdo cuvier)*

It is interesting to note that the Tiger Shark, which is also a wide-ranging species, (weighing up to 807kg and measuring up to 7.4m), and is second only to the White Shark in terms of recorded attacks (145 including 28 fatalities) on humans, has been recorded from as far north as Icelandic waters. Indeed, the possibility of this species' occurrence in UK waters was acknowledged following a reliable report of an aggressive encounter with a shark fitting its description by a diver off the north coast of Cornwall during July 1968.

Shortfin Mako Shark *(Isurus oxyrinchus)*

Although the Shortfin Mako Shark is rarely recorded from Northern European waters (there are only 3 authenticated records from Irish waters, most recently in August 1988), it is relatively common in the Bay of Biscay and is commercially exploited off the Spanish coast. It is a relatively large shark, weighing up to 554kg and measuring up to 4.3m, and has been implicated in several (45) attacks on humans (including 2 fatalities), albeit none in European Atlantic waters where the species has previously been misidentified as Porbeagle Shark.

Blue Shark *(Prionace glauca)*

Blue Sharks migrate into Irish inshore waters during the summer months where they are frequently targeted by anglers and to a lesser extent, by commercial fishermen. However, the sharks which occur in Northern European waters are predominantly immature females and therefore relatively small. The current rod & line caught records for Ireland and the UK are 96.6kg (Achill, October 1959) and 99.1kg (Looe, Cornwall, 1959) respectively, compared with the World Record of 239.45kg (Montauk Point, NY, USA, September 2001). Nevertheless, Blue Sharks have accounted for 38 attacks on humans, including 4 fatalities, albeit none in Northern European waters.

Photos: © Declan Quigley

Porbeagle Shark *(Lamna nasus)*

The Porbeagle Shark occurs around the Irish coast throughout the year and is fairly common in some areas. It is a relatively large species, attaining a weight of up to 230kg and a T.L. of 3.5m. Porbeagles have accounted for a total of 5 non-fatal attacks on humans. At least two, and possibly three, non-fatal attacks have been attributed to Porbeagles in UK waters: the first in 1876, between Hastings & Fairlight, Sussex; the second on 27 July 1969 (no locality); and the third on 1 June 1971 off Beesands, South Devon. Porbeagles have also been filmed making fast passes at divers on oil platforms in the North Sea without attacking. This is probably agonistic (defensive) or exploratory behaviour.

Smooth Hammerhead Shark *(Sphyrna zygaena)*

There are only six authenticated records of Smooth Hammerhead Shark from UK waters, five of which were recorded between 1829 and 1865, and the sixth (head only) in December 2004 (Portreath, Cornwall). Although a total of 39 attacks (including one fatality) have been attributed to Hammerhead Sharks (Sphyrnidae) in general, only one of these was identified to species level (Great Hammerhead Shark *S. mokarran* Ruppell 1837). The latter species has not been recorded in European Atlantic waters.

Table 1. Potentially dangerous sharks recorded from Irish & other European Atlantic Waters

Common Name	Family, Genus & Species	Max. Distribution Northern Europe	Irish Status	Max. T.L. (cm)	Max. Wt. (kg)	Worldwide Attacks Total	Fatal
Cow Sharks	Hexanchidae						
Sixgill Shark	Hexanchus griseus	[illegible]	scarce	[illegible]	[illegible]	1	0
Dogfish Sharks	Squalidae						
Spur Dogfish	Squalus acanthias	> Arctic Circle	common	[illegible]	[illegible]	1	0
Sleeper Sharks	Somniosidae						
Greenland Shark	Somniosus microcephalus	> Arctic Circle	rare	[illegible]	[illegible]	1	0
Houndsharks	Triakidae						
Tope	Galeorhinus galeus	[illegible]	common	[illegible]	[illegible]	1	0
Thresher Sharks	Alopiidae					[illegible]	0
Bigeye Thresher	Alopias superciliosus	[illegible]	rare	[illegible]	[illegible]	[illegible]	0
Thresher Shark	Alopias vulpinus	[illegible]	scarce	[illegible]	[illegible]	[illegible]	0
Basking Shark	Cetorhinidae						
Basking Shark	Cetorhinus maximus	> Arctic Circle	common	[illegible]	[illegible]	[illegible]	[illegible]
Mackerel Sharks	Lamnidae						
White Shark	Carcharodon carcharias	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Shortfin Mako	Isurus oxyrinchus	[illegible]	rare	[illegible]	[illegible]	[illegible]	[illegible]
Longfin Mako	Isurus paucus	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Porbeagle Shark	Lamna nasus	> Arctic Circle	common	[illegible]	[illegible]	[illegible]	0
Requiem Sharks	Carcharhinidae						
Bignose Shark	Carcharhinus altimus	[illegible]	unknown	[illegible]	[illegible]	1	0
Bronze Whaler	Carcharhinus brachyurus	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Spinner Shark	Carcharhinus brevipinna	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Silky Shark	Carcharhinus falciformis	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Blacktip Shark	Carcharhinus limbatus	[illegible]	unknown	[illegible]	[illegible]	[illegible]	1
Oceanic Whitetip Shark	Carcharhinus longimanus	[illegible]	unknown	[illegible]	[illegible]	[illegible]	1
Dusky Shark	Carcharhinus obscurus	[illegible]	unknown	[illegible]	[illegible]	[illegible]	1
Sandbar Shark	Carcharhinus plumbeus	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Tiger Shark	Galeocerdo cuvier	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Blue Shark	Prionace glauca	[illegible]	common	[illegible]	[illegible]	[illegible]	4
Hammerheads	Sphyrnidae					[illegible]	1
Scalloped Hammerhead	Sphyrna lewini	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Smalleye Hammerhead	Sphyrna tudes	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]
Smooth Hammerhead	Sphyrna zygaena	[illegible]	unknown	[illegible]	[illegible]	[illegible]	[illegible]

Oceanic Whitetip Shark *(Carcarhinus longimanus)*

One of the most extraordinary shark tales in recent times involved the discovery of an Oceanic White-tip Shark that had clearly lost its way and was discovered swimming around a warship in a brackish water fjord near Gullmarsfjorden in west Sweden during September 2004. It died shortly afterwards. The specimen, a male, measuring 2.3m long and weighing 65.65 kg is the first record of this species in Northern European seas. The species has accounted for a total 9 attacks on man, including one fatality.

Thresher Sharks *(Alopias vulpinus & A. superciliosus)*

The Thresher Shark and Bigeye Thresher Shark are regarded as scarce and rare in Irish waters respectively (see *Sherkin Comment*, Issue 40, 2005). Threshers in general have been implicated in a total of 5 authenticated non-fatal attacks on man worldwide. During the early 1970s it was reported that a pair of Threshers attacked a child who was swimming in very shallow water on the Kent coast. Although the sharks failed to inflict any serious damage to the child, he was apparently knocked about rather badly.

Basking Shark *(Cetorhinus maximus)*

The Basking Shark is relatively common all around the Irish coast and although it only feeds on plankton, due to its very large size (weighing up to 4 tonnes and measuring up to 9.8m), it is considered to be potentially dangerous if provoked. Indeed, during September 1937, the species was involved in two non-fatal attacks on boats in Scottish waters.

Other Potentially Dangerous Shark Species in Irish & European Atlantic Waters

In addition to the species mentioned above, a number of other species of shark which are known to occur in Irish waters have been implicated, albeit very rarely (≤ 1) in non-fatal attacks on humans in other parts of the world: Sixgill Shark, Spur Dogfish *(Squalus acanthias)*, Greenland Shark *(Somniosus microcephalus)* and Tope *(Galeorhinus galeus)*. However, several other species which to date have only been recorded, albeit rarely, from more southern European waters (France/Spain/Portugal) are potentially more dangerous to humans: Dusky Shark *(Carcharhinus obscurus)*, Bronze Whaler *(C. brachyurus)*, Spinner Shark *(C. brevipinna)*, Sandbar Shark *(C. plumbeus)*, Silky Shark *(C. falciformis)* and Bignose Shark *(C. altimus)*.

Conclusions

Although in the past sharks have often been vilified and maligned as ruthless indiscriminate killers, there is a growing appreciation and concern that these wonderful animals (who should make no apology for being top predators in their own domain) constitute an important part of the world's complex aquatic ecosystems and as such, deserve to be protected and conserved. While it is clear that a number of potential "man-eating" sharks already inhabit Irish waters, it would appear that the odds of being attacked by one, let alone consumed, are statistically remote.

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Polonium

By Anthony Toole

ONE of the major items of news toward the end of 2006 involved the mysterious death of former Russian agent, Alexander Litvinenko. His murder, with its background of 'cloak-and-dagger' secrecy has been likened to an episode from a John Le Carré novel. The poison responsible for his death is believed to have been an isotope* of the metal, polonium. This is an intensely radioactive element, and on ingestion into the body, will irradiate any cells in its vicinity, leading to rapid breakdown of DNA and other cell molecules. It is one million-million times as toxic as cyanide. Despite the fact that very few people, until now, have heard of polonium, the story of its discovery and its subsequent history is one of the great, and ultimately tragic tales of science.

Polonium is a member of the same family group of elements as oxygen, sulphur, selenium and tellurium. The Russian chemist, Dmitri Mendeleev predicted its existence in 1891, as a result of his development of the Periodic Table. While all elements, even common ones like hydrogen and carbon, have radioactive forms, or isotopes, the first elements to be discovered that were radioactive in all their isotopes, were uranium and thorium, which were isolated in 1789 and 1815, respectively.

At the times of their discovery, radioactivity was an unknown phenomenon, and remained so until Henri Becquerel, in 1896, noticed the effect of pitchblende, an ore of uranium, on a photographic plate. In the classic description of his discovery, he tells of placing a piece of the ore near the sealed plate in a laboratory drawer. A key lay on top of the plate. When the plate was developed, it contained an image of the key, which could only have been formed by invisible rays coming from the rock. However, subsequent investigations showed that the pitchblende was far more radioactive than could be explained by uranium alone.

Becquerel's colleagues, Pierre and Marie Curie, set about solving the discrepancy. Starting with several tonnes of the ore, which they were able to obtain from Austria, and after many months' labour, they isolated less than a gram of a new element, which they named polonium, in honour of Marie Curie's birth country, Poland.

For their discovery of radioactivity, Becquerel and the Curies shared the Nobel Prize for Physics in 1903. Marie Curie went on to receive a second Nobel Prize, this time for Chemistry, in 1911, for her discoveries of polonium and another radioactive element, radium.

Polonium is extremely rare, being one of the ten least abundant elements in the Earth's crust. It exists as several isotopes, with mass numbers from 194 to 218. (All atoms of polonium contain 84 protons in their nuclei. The differences in mass number are due to varying numbers of neutrons.) The most common isotope, and the one thought to be responsible for the poisoning of Alexander Litvinenko, is polonium-210.

Extraction of polonium from uranium ore is very inefficient, and it is now obtained, to the extent of around 100 grams each year, by neutron-bombardment of the metal bismuth, in a nuclear reactor. Its intense radioactivity means that it generates much energy, and it is used as a lightweight, non-mechanical heat source in space satellites. When alloyed with beryllium, it provides a source of neutrons in nuclear weapons.

It was used, for a time, to remove the static electricity that often builds up on textiles during their manufacture. The alpha radiation from the polonium caused the air molecules in its vicinity to become electrically charged. This, in turn, allowed the static to leak away. A similar mechanism prevented dust from clinging to photographic film during its manufacture. Nowadays, a source of beta radiation is used as a safer alternative for these purposes.

The minuscule concentration of polonium in rocks means that it is unlikely to enter our diet. Nevertheless, it is a natural decay product of the radioactive gas, radon, which is present in very low concentrations in air, and is therefore found to a tiny extent in all our bodies.

Marie Curie died of leukaemia in 1934 as a result of her years of exposure to radium. Alexander Litvinenko was not the first person to have been poisoned by polonium. Marie Curie's daughter, Irene, carried on her parents' tradition of scientific research. Along with her husband, Frederick Joliot, she was awarded the Nobel Prize for Chemistry in 1935 for work on artificial radioactivity. In 1956, she died, like her mother, of leukaemia. Her death, however, is believed to have resulted from her exposure to polonium as a result of a laboratory accident fifteen years earlier.

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*one of two or more atoms with the same atomic number but with different numbers of neutrons

The Cork Coat of Arms


Courtesy of Cork City Council

By Fr James Good

COATS of arms first came into existence to fulfil the same purpose as football-jerseys – to identify the participants in a competition. Their most frequent use in the Middle Ages was to identify knights at their favourite game of jousting – riding their horses at one another at full tilt, each knight trying to unhorse the other with a long lance.

Later on, Popes and bishops and royal families adopted coats of arms. Soon the style and design became very complex, usually with warlike symbols – lions, battle-axes, shields and so on. Up to very recently, all coats-of-arms carried a motto in the Latin language, which for many centuries remained the language of diplomacy and heraldry.

Without even looking at the Latin motto underneath, we can see the general meaning of our Cork coat of arms. It depicts a ship sailing in between two towers – into a safe harbour. And that is what the Latin motto tells us. It reads: STATIO BENE FIDA CARNIS, meaning "a harbour quite safe for ships". And of course most Cork people are proud in the knowledge that their harbour is one of the biggest and best harbours in the world.

Origin of the motto

Many people will be surprised to learn, however, that when the motto first appeared in print, it meant exactly the opposite of what it says today. It was penned by the Roman poet Vergil (who died in the year 19 B.C.) in his epic poem the Aeneid. He was describing a very dangerous harbour. He wrote: "Statio haud bene fida carinis" – "a harbour in no way safe for ships".

Sadly, we have no way of knowing who was the smart Corkman who dropped the world "haud" (in no way) and left us with the beautiful motto that we have today for our coat-of-arms: "a harbour quite safe for ships".

It is a great boost to Cork people to see their city's coat-of-arms displayed so prominently in so many places. Alas! I saw a "howler" of a misprint recently in the coat-of-arms as displayed on one of our prominent buildings in Cork city. It would perhaps be unkind to "name and shame" it, but perhaps somebody in that academic institution will spot the error in the accompanying photograph and rectify it. Even Homer sometimes nods.

Fr James Good, Douglas, Cork.

Can you spot the error? Any idea where it appears?

REHAB

Recycling for the Future

Photos: © Rehab Recycle

Electrical recycling at Rehab Recycle

By Dara Duffy

REHAB Recycle is part of Rehab Enterprises, the commercial division of Rehab Group whose wide remit also includes training, employment and social care. Each year more than 60,000 people access these services in the Group's network of 208 centres. Between the Group companies – Rehab Enterprises, RehabCare, National Learning Network and Rehab Lotteries in Ireland and the UK companies – 3,000 staff are employed.

Established in 1984 in Monahan Road, Cork, primarily to create employment opportunities for people with disabilities, Rehab Recycle has grown to become an Irish success story and a major force in Ireland's recycling industry, with facilities in Dublin (Ballymount, Ballyfermot and Tallaght), Cork, Galway, Navan and Eindhoven in the Netherlands. Rehab Recycle's combined glass, can, paper, electrical and electronic waste recycling now accounts for in excess of 75,000 tonnes of material each year.

In purely economic terms, Rehab Recycle is just one of many Irish companies to have grown in recent years. Its real achievement, however, is to have assisted workers with disabilities to prove that they have a role to play in the growth of a company and in the creation of wealth in this country. Although operating in an increasingly competitive market, Rehab Recycle's unique integrated employment model provides a supported environment for people with disabilities within the workplace. Assisted by the Government's Wage Subsidy Scheme (WSS), a total of 104 people with disabilities are employed in Rehab Recycle's 162-strong workforce.

In the 23 years since it was first established, Rehab Recycle has been responsible for every major advance in Ireland's glass recycling sector. The company began with an initial base of just 10 bring sites and only rudimentary equipment that consisted mainly of a crusher and a single second-hand collection vehicle. In its first year of operation, Rehab Recycle processed 300 tonnes of glass cullet. In 2007, the company reaches this figure every day before lunch.

Today, Rehab Recycle is the largest glass recycler in Ireland and is the only glass recycling company that operates nationally. The company currently reprocesses approximately 70 per cent of glass recycling in the State. As a result, Rehab Recycle contributes significantly to the achievement of EU targets for recycling of packaging waste.

According to Rehab Recycle's General Manager, Bob Rowat, when Rehab Recycle was first established in 1984 the vast majority of waste went straight into landfill. "The cost of landfill was very cheap, so there was initially no real political will to focus on recycling. However, as time went on there was a growing recognition of the ever-increasing pressure on landfill sites and the importance of waste management. Glass was the ideal product to focus on as it is easily recyclable and is both bulky and heavy."

In co-operation with local authorities and Repak, Rehab Recycle expanded rapidly during the 1990s. In addition to the facility in Cork, the company's first Dublin plant opened in Santry in the early 1990s, and this was followed in 1999 by the establishment of the larger and more modern Ballymount plant. The company underwent its most significant period of growth between 1995 and 2001 when the number of bring sites quadrupled in just six years.

"A glass bottle that is landfilled now will still be there in the year 5000, and beyond," said Mr Rowat. "By collecting and recycling glass, Rehab Recycle not only reduces pressure on our landfill sites, but saves energy."

"It is estimated that the energy saved from recycling one glass bottle is enough to keep an electric light bulb lit for four hours. In fact, a staggering 2.3 million gallons of fuel is saved each year purely through the recycling of glass."

With over 1,800 bring sites nationwide, Rehab Recycle will this year process a staggering 200 million glass bottles and jars, enough to fill Ireland's largest sporting stadium, Croke Park, to a height of 42 feet. Rehab Recycle not only collects glass deposited by the general public at bring sites nationwide, the company also specialises in the collection and recycling of glass from pubs, clubs and other businesses and has pioneered collection schemes in restricted access areas such as Cork City, Galway City and Dublin's Temple Bar.

In the early 1990s, the company built on the success of its glass recycling service with an expansion into can, paper and cardboard recycling, as well as a service that ensures the secure destruction of confidential documents and information for a variety of commercial and state organisations, including many Government departments, financial institutions and hospitals.

According to Mr Rowat, the company's plans for the future include strengthening its position as Ireland's largest glass recycler as well as the continuing development of new markets and recycling initiatives. In 2004, Rehab Recycle opened its first waste electronic and electrical (WEEE) recycling facility in Tallaght, and this service continues to expand. The company offers a full take back service to businesses nationwide that ensures not only WEEE disposal, but also guaranteed data destruction and a complete audit trail.

In 2006, Rehab Recycle began development work on Ireland's first Expanded Polystyrene plant. The plant, which is based in Navan, County Meath, is set to open later this year and will service all the expanded polystyrene waste streams for the Leinster area.

Meanwhile, earlier this year, Rehab Recycle launched a highly successful new initiative with Microsoft to provide schools and charities with software and recycled/refurbished computer equipment. In addition, agreement was reached with WEEE Ireland for Rehab Recycle to supply every primary school in Ireland with a recycled computer as part of a programme to raise awareness about electrical and electronic waste recycling.

According to Mr Rowat, Rehab Recycle's plans for the future include a consolidation of the company's asset recovery business, which although only recently launched, already boasts computing giant Dell as a customer. Rehab Recycle is increasingly looking to provide a total waste management solution for large and small businesses nationwide. With growing waste charges and a heightened awareness of the need for commercial businesses to be environmentally friendly, it is a business that clearly has huge potential.

Glass sorting at Rehab Recycle, Ireland's largest glass recycler

A truck collecting glass at Rehab Recycle

Dara Duffy, Rehab Recycle, Roslyn Park, Beach Road, Sandymount, Dublin 4

The Wildlife Trusts in the UK

The UK partnership of Wildlife Trusts cares for around 2,500 nature reserves cover over 80,000 ha, with a membership of over 600,000 people.

By Jane Clark

THE Wildlife Trusts are the fasting growing conservation charity in the UK, with the 47 Wildlife Trusts across the UK forming an affiliation or partnership. The Partnership campaigns for the protection of wildlife and invests in the future by encouraging people of all ages to get closer to wildlife. By working together as a partnership (often in conjunction with other conservation organisations including Natural England, RSPB, Environment Agency and the National Trust), we aim to influence government (local, national and European) and key influencers to protect wildlife and habitats. Most recently at the national level we have campaigned to gain positive outcomes for wildlife through the Countryside Rights of Way (CROW) Act and the Marine Bill.

The UK Partnership cares for around 2,500 nature reserves covering over 80,000ha and has a membership of over 600,000 people. There are also over 30,000 volunteers helping us with this work, their efforts contributing to the equivalent of more than 240,000 volunteer days. Volunteering roles can vary from administrative roles, practical conservation work on a reserve, or being a volunteer warden for one of our reserves to fundraising, leading guided walks, giving talks to promote the work of the Trust, surveying and biological recording. The variety of roles is endless and without such volunteers we would not be able to do as much as we do.

Each of the individual 47 Wildlife Trust is dedicated to conserving, protecting and enhancing the habitats and wildlife in its local area as well as supporting the national initiatives described above. At a local level our Trust, (Herts and Middlesex) has been actively involved in discussions on airport expansion, proposals for housing and other building development and minerals extraction affecting our area.

Herts and Middlesex Wildlife Trust (HMWT) was formed in 1964 and now owns and manages 43 nature reserves covering over 800ha of land and has over 16,000 members across the two counties. HMWT comprises Council of Management (made up of voluntary Trustees), a small team of about 20 paid staff and a huge army of volunteers. Our offices are based at Grebe House in St Albans.

HMWT works to conserve, protect and enhance the habitats and species in our area, including those that are especially threatened e.g. Stag beetles, cornflowers, water voles, bitterns, dormice and otters. Firstly we manage our own nature reserves including ancient woodlands, old grasslands, wetlands and heathlands. Some of these sites have statutory protection as SSSI's (Sites of Special Scientific Interest) due to the diversity of species and habitats found there. Nature reserves are great places to visit not only for wildlife but people as well! They offer some of the counties' best sites for wildlife and provided good examples of successful wildlife management. Our 43 nature reserves are open all year and there is no charge to visit these havens for wildlife.

It would be hard to describe all 43 reserves to you in this article but we have recently successfully purchased with the help of our members and other fundraising organisations a large wetland reserve known as Amwell Nature Reserve situated in East Hertfordshire. This reserve which was once a former gravel pit is now one of Hertfordshire's top sites for breeding and wintering wildfowl.

Photos: © HMWT

An aerial view of Amwell Nature Reserve, East Hertfordshire, UK.

Previously owned and managed by the St Albans Sand and Gravel Co Ltd (later RMC Aggregates (London) Ltd), development of the site as a wildlife reserve started in 1983 – whilst mineral extraction was still being undertaken. By 1990 when extraction ceased, the creation of diverse environments to attract wildlife was well underway. In addition to the 200 species of resident or visiting birds, 315 plant, 20 butterfly, 16 dragonfly and nine (nationally scarce) beetle species have also been recorded there.

We also advise other landowners on managing their sites – either directly or by working in partnership with other conservation organisations in the wider countryside and influencing local authorities. Local authorities play a major role in nature conservation, ensuring appropriate policies for wildlife are developed and are included in their plans as well as regional planning documents. We also advise them on individual planning applications, with an average of 600 being responded to each year!

HMWT led partnerships provide a focus for the problems facing certain habitats and species such as the Hertfordshire Water Vole Project (the water vole which is Britain's fastest declining mammal) and Hertfordshire County Wildlife Sites Partnership, where we coordinate and carry the recording and monitoring not only of our own reserves but also other landholdings across the two counties. The data collected contributes to the monitoring of the Hertfordshire and Middlesex environment and forms an important part of the County and Local Biodiversity Action Plan process. It is also a valuable tool in enabling owners, planners and conservation bodies alike to work together to make informed decisions about the future management of various sites and protect the county's biodiversity.

This is only a brief synopsis of the work my local Wildlife Trust and the UK Wildlife Trust Partnership undertake and it is the dedication and passion of its staff, volunteers and members that enable us to continue to do this fantastic and rewarding work whilst facing the various environmental challenges such as climate change, pollution and housing development around us. If you ever get a chance, stop off at a Trust Reserve and enjoy the wildlife on offer and see the work we do first hand!

By Jane Clark, Wildlife Sites Officer, Herts & Middlesex Wildlife Trust, Grebe House, St Michael's Street, St Albans, Hertfordshire AL3 4SN, UK. Tel: (01727) 858901 Fax: (01727) 854542

Common Frog – not so common any more.

Photos: © Jim Wilson/www.irishwildlife.net

Is there a place for our natural heritage in 21st Century Ireland?

By Jim Wilson

BEFORE we can attempt to answer the question we need to be sure we know what exactly is our natural heritage. To me our natural heritage is the wildlife and geographical features of our island home. It usually refers to our wild animals and plants but also includes the habitats where they (and we!) live, such as seashore, estuary, rivers, lakes, bogs and mountains.

Is there a place for all that in 21st Century Ireland? There has to be, but judging by the way we are treating it at the moment it looks like there is not. What was once celebrated in song and verse by our forefathers is now cast as the obstructive, awkward opponent to "development", having little or no value in a modern Ireland. And before you say that's not true think about what happens when we want to build a new road, housing development or marina. Natural heritage rarely gets serious consideration.

At government level many who speak out for our natural heritage are looked on as traitors to "progress". One would be forgiven for thinking successive governments have treated natural heritage as something they would prefer to do without, pushing it from government department to government department and gradually watering it down to an embarrassingly low level of importance. There is also the fact that, because of our small population, we assume that our natural heritage will always be with us and losing a bit here and there will not make any real difference.

After thirty years of work in the area of conservation I have come to the conclusion that most people in Ireland do not look on nature as part of their heritage in the same way as they do old buildings or human traditions such as music and storytelling. Many of us see it not as something to be valued for its own sake, for its beauty, but just something to be exploited for short-term gain.

Before the invention of the engine our ability to transform our landscape and damage our natural heritage was limited. However, in the last 100 years that has changed completely and forever. Because of our "intelligence" we have successfully learned to exploit the resources of our planet and here in Ireland it is no different. Since the success of the celtic tiger that transformation has gone into overdrive. It does not take a rocket scientist to see that we are destroying our natural heritage at an alarming rate, and we don't seem to want to do anything about it.

In the 1970s and 1980s I used to laugh at the American TV programmes with their vast shopping malls, their huge "gas guzzling" cars and SUVs, road rage, rush hour traffic, grid lock, outsized refrigerators and televisions the size of cinema screens. It didn't take long for us to catch up and it seems we didn't learn from their mistakes either.

The indicators of "prosperity" in modern Ireland, as in all countries on the planet, are things like spending up to four hours of our waking day in traffic and driving to a gym to get our exercise. Our chaotic transport system and the blind belief in the car are creating an environment where natural heritage has no place. In 2005 there were 219,284 new cars licensed in Ireland. If these were placed bumper to bumper they would stretch from Killarney to Dublin and back again! That's new cars for just ONE year! The number of licensed vehicles has doubled since the 1990s.

Ireland is not getting any bigger so the only way to accommodate all these cars is to make new roads and widen existing roads, thus removing more and more of our natural heritage. Modern Ireland has decided to turn a blind eye to this issue, which will only get worse. When are we going to come to the inevitable conclusion that we cannot fit any more cars on the "emerald" isle?

Because we have made the motorcar one of the gods of modern Ireland we have relegated pedestrians and cyclists to the level of second-class citizens, and left public transport to those who cannot afford a car and those few who want to combat global warming in a practical way. As a result we have further detached ourselves from our natural heritage. Our whole lifestyle now revolves around the car. It has become increasingly difficult to easily access areas of natural beauty without one, and the idea of a quiet relaxing walk on a country road is a thing of the past – anyone attempting it is taking their lives in their hands. No proper provision has been made for pedestrians and cyclists to use the "public highway" in safety. Where there are footpaths they have been commandeered by motorists as car parks, keeping their precious machines out of harm's way while forcing pedestrians out onto increasingly busy roads. Media advertising by car manufacturers blatantly disregards responsible use of the vehicles they want to sell, feeding us images of speeding cars on empty country roads and SUV's thundering across wilderness landscapes, the very places that should be preserved for everyone, not abandoned as playgrounds for those who have no regard for our natural heritage.

I am not suggesting we should all become ornithologists or entomologists and spend our days in a bog studying an ugly insect with an unpronounceable name. In fact to enjoy the natural world around us does not require you to be able to identify any of the plants or animals on this island. Our natural heritage is not just for a few tree huggers and twitchers – it's for everyone to enjoy. It also has a serious role in maintaining our modern lifestyle. Two of Ireland's largest industries, tourism and agriculture, depend on it for their very existence.

We wonder why our social problems are increasing and why we don't seem to be any

Shield Bug on Alder Leaf – as fascinating as an insect from a tropcial rain forest.

Puffin – Most irish people know more about Cheetahs in Africa than Irish Puffins.

happier despite all this new found wealth. Our children are growing up in an increasingly electronic environment where they can be entertained without leaving the couch. If you want to look at your natural heritage buy the DVD or look at it on the Discovery channel. No need to go out at all.

I seriously believe that if nature studies were given a more prominent place in our education system and we developed "outdoor classrooms" where we and our children could learn about the amazing natural world around us, we would be able to use our natural heritage to help us maintain a healthy balance between the amazing technologies that enrich our lives and the natural wonders on our door step. The government needs to plan for the provision of outdoor classrooms – new large public suburban parks and a network of nature reserves with education facilities and staff. For a relatively small investment the returns would be both long lasting and very valuable.

I believe that there is a place for our natural heritage in 21st Century Ireland. I think it is possible to have all the trappings of modern life and also a healthy green environment where we can go to escape the madness of our motorised, electronic, media driven, high speed lives. Whether we have the vision and willingness to do it remains to be seen.

Jim Wilson, www.irishwildlife.net

Photos: © Jim Wilson/www.irishwildlife.net

A flower rich field – a beautiful sight on a walk.

PUBLICATIONS OF INTEREST

Flora Celtica *Plants and People in Scotland*

By William Milliken & Sam Bridgewater

Birlinn Limited & Royal Botanic Garden, Edinburgh

www.birlinn.co.uk

ISBN: 978 1 84158 303 7

Price: £30.00stg / 2004

Here is an elegant and informative synthesis of the interaction of plants and people in Scotland. The obvious comparison is with Richard Mabey's Flora Britannica (1996), but the authors concentrate on Scotland – with a nod to global cultures such as the Amerindians. They also seek out practicalities rather than folklore (a little too much of that recently), finding a vibrant, living ethnobotanical tradition. Timber, thatch, dyes, basketry, medical plants and sustainable harvests of everything from gorse to kelp and edible seaweeds, are grist to their mill. This arrangement of species thematically draws out more information than had the text been arranged by species. Superb photos, many by William Milliken, clear English and clean layout make this book a triumph. Governments should take heed of the great economic resource that is a native flora.

John Akeroyd.

Wild Belfast *on safari in the city*

By Robert Scott

The Blackstaff Press, Belfast

www.blackstaffpress.com

ISBN:0-85640-762-3

Price: £12.99stg / 2004

The last two decades have seen growing interest in the wildlife of cities. Studies of the floras of Dublin and Belfast have yielded hundreds of wild flowers, and now Robert Scott reveals the wealth of varied wildlife in his native Belfast. He gives an enthusiastic account of plants, birds, mammals and invertebrates in a mosaic of habitats that link the city centre with the rivers, seas, coasts and mountains at the edge of Belfast. The Belfast Hills support several mountainy birds: ring ouzels, red grouse and even (migrant) snow buntings. City parks have orchids: broad-leaved helleborine, common spotted orchid and lesser butterfly-orchid. Such urban and suburban biodiversity is a marvellous showcase for natural history, and the author makes one want to visit Belfast immediately. The book ends with details of a Top 20 of the city's wildlife sites.

John Akeroyd.

A Bird in the Bush – *A Social History of Birdwatching*

By Stephen Moss

Aurum Press

www.aurumpress.co.uk

ISBN: 1 84513 085 5

Price: £8.99stg / 2005 (pb)

What a book. Forget that its about birdwatching, it tells a wonderful story from the first birdwatchers in the 1700s to the present day. I have always believed that they are a breed apart. Birdwatching is a passion. Birders get up at dawn, will go out in all types of weather, will stand or sit for hours on end waiting and watching. If it is a rarity then they become oblivious to everything. I often say they would not see a JCB bearing down on them.

The opening chapter on those early 18th century naturalists: White, Clarke, Berwick and Montague gives a wonderful picture of those talented individuals who without the present day "bird guides" left such a legacy. The author states "Like White, Clarke had no paper optical aids so his observations all had to be done with the naked eye. In his writings he emphasised the behaviour of birds rather than the modern obsession with fine plumage details." I wonder are many of today's birdwatchers more interested in "trophy gathering " rather than taking the Clarke option. The 1800s again saw wonderful birders and naturalists – they included Mark Catesby, William Bartram, Alexander Wilson and the great John Audubon.

The book has seventeen chapters, each more fascinating than the last. They include the Victorian Era, early 20th century, World War I and II and above all how birding became an obsession. As I said, a wonderful book – and I say that as a non-birder!

How to Live a Low-Carbon Life – *the individual's guide to stopping climate change*

By Chris Goodall

www.earthscan.co.uk

ISBN: 978 818 44074266

Price £14.99stg / 2007

This book is so appropriate in the present "climate" of emissions of carbon dioxide. It shows how individuals rather than governments or companies are going to have to be the driving force behind reductions in greenhouse gases. Very few of us know how our day to day living generates emissions of CO2 and other harmful gases. Seventeen chapters cover such topics as Home and Water Heating and Cooking; Food; Lighting and House Appliances, Travel – air, car and public transport and Use of Renewable Energy. We learn that the EU average of greenhouse gas emissions by each person is 12.5 tonnes of carbon dioxide. Half of this approximate 6.0 tonnes is directly created by the individual in running a house, a car and taking transport. The other half – 6.5 tonnes – is generated by other activities such as manufacturing, offices, smelting iron ore and transporting goods.

The author points the way to getting down to 3 tonnes emission per person. All seem reasonable except air travel where the author suggests air travel should be reduced by 1.8 to zero. To follow such a suggestion would see world trade and tourism disappear. Using more car travel is suggested but this is not practical in many cases. This issue aside this book has so much to offer each of us and is an important contribution in how we can reduce each of our emissions of greenhouse gases.

Climate Change and Insurance – *Disaster Risk Financing in Developing Countries*

Guest Editor Eugene N. Gurenko

www.earthscan.co.uk

ISBN: 9781844074839

Price: £60.00stg (hk) / 2007

Over the years, when national catastrophes occur in developing countries, the one thing is certain – media commentators never mention anything about insurance cover. Yet if it happens in the developing world, after the initial day or two, describing the disaster becomes all about who has or has not got insurance cover. This book states that if the scientific global climate models are accurate, the present problems will be magnified in the near future. Changes will have profound impact upon the lives, health and property of millions of people. It is important to read that in response to the Kyoto Protocol, the Munich Climate Insurance Initiative (MCII) was founded in 2005. The members included representatives of the insurance and re-insurance industry, climate experts, NGOs and policy researchers. The articles in this publication are intended to stimulate discussion on insurance and how they can help in adapting to a changing climate and the corresponding risks.

Of the eight articles, the one on "Insurance for assisting adaptation in climate change in developing countries; a proposed strategy", points the way for:

- The establishment of a climate insurance programme specialising in supporting developing countries;
- Public-private insurance related instruments that are affordable to the poor;
- Disaster relief contingent on countries making credible efforts to manage their risks.

Highly recommended for anyone involved with getting aid to developing countries.

Flood Hazards & Health *Responding to Present and Future Risks*

Edited by Roger Few and Franziska Matthies

www.earthscan.co.uk

ISBN: 978-1-84407-215-6 (hbk)

ISBN: 978-1-84407-216-3 (sbk)

Price: £80.00 (h) £22.46 (s) / 2006

Flooding, forever in the news, is a global phenomenon, although South Asia suffers disproportionately. As well as causing physical and psychological damage, flood waters expose victims to disease and disease vectors. The eight chapters of this book collate and review existing knowledge from environmental, social and epidemiological studies, while indicating priorities for future research, policy and practice in relation to the risks posed to human health, especially among already disadvantaged people. The book concludes that flooding is episodic and variable, but that alterations in land use and settlement patters, together with climate change (the evidence remains inconclusive for upward trend in flooding due to global warming) will intensify flooding problems in the future. A 29-page bibliography covers a wider range of disciplines relating to flooding.

John Akeroyd.

High Seas Bottom Trawl Fisheries and their Impacts on the Biodiversity of vulnerable Deep-Sea Ecosystems: *Options for International Action*

By Matthew Gianni

www.iucn.org / themes / marine

ISBN: 2-8317-0824-9

Price: Free (postage only) / 2004

Seamounts, coral reefs and other vulnerable deep-sea ecosystems suffer from bottom trawl fishing in the high sea. This book makes recommendations as to how the issues must be addressed if the above are to be protected. Virtually all high seas bottom trawl fisheries are presently unregulated in so far as their impacts on deep sea biodiversity are concerned. Most are not covered by a regional fisheries management organisation and so there is no commitment to regulate deep-sea bottom fishing. No one can give an accurate figure of the tonnage of the fish catch. So much is illegal and unreported.

Losses of up to 95-98% of the coral cover of seamounts as a result of deep-sea bottom trawl have been documented. Because of the damage by trawl fishing, the very fish stocks being fished are rapidly being depleted. The author calls for the establishment of an international regime for deep water fisheries on stocks and associated species which are found exclusively on the high seas, as well as the establishment and implementation of effective mechanisms for monitoring compliance and enforcement for high seas bottom fisheries.

This book is a superb and essential read for fishermen, managers and scientists.

Alaska's Fishing Communities – *Harvesting the Future*

Conference proceedings

Alaska Sea Grant College Program

www.alaskaseagrant.org

AK-SG-07-02

ISBN: 1566121205

Price: $10.00 / 2007

This book is so relevant. It is a book that should be read by bureaucrats in the European Commission that seem to have no understanding of how their policies affect fishing communities in coastal areas. The papers at this conference in Anchorage, Alaska in 2006 cover many topics, which include:

- Looking out for the future of small fishing communities
- Rural communities in a Global Marketplace
- Fishing Benefits Communities
- Models for Community Organisations
- Fishing as a Long-term Economic source

These are but a few issues discussed and each one of these is vital to the survival of everyone of Ireland's fishing ports from Hook Head to Castletownbere to Malin Head. The celtic tiger will not save them – self-promotion, self-preservation and above all proper sustainable fishing policies are the only remedies. The new Fishermen's Federation should consider a similar conference as this one before Irish fishing villages become holiday home villages. The book is a must for anyone wanting to see our coastal areas survive and prosper.

Fishers' Knowledge in Fisheries Science and Management

Edited by Nigel Haggan, Barbara Neis and Ian G. Baird

ISBN: 978-92-3-104029-0

www.unesco.org / publishing

Price: €30.00 / 2007

In so many countries, scientists and managers who decide what fish species and tonnage may be caught in the sea, have ignored the knowledge that fishers (fishermen) have gained from many years at sea. This book shows that there is a little light at the end of the tunnel. It originated from a conference called "Putting Fishers Knowledge to Work". It has three sections:

- Indigenous practitioners & researchers
- Indigenous & artisan fisheries
- Commercial fisheries

The most important paper of the 22 papers is "Integrating fishers knowledge with survey data to understand the structure, ecology and use of a seascape off south-eastern Australia". It describes the role of fishers at all stages of the fishing assessment and management process. Scientists meet regularly with experienced fishers. They integrate the ecological knowledge of the fishers with scientific survey data to map and understand the seabed in a way that would not have been possible from scientific data alone. Vast areas of the seabed off SE Australia were mapped which would have otherwise been impossible. Another paper is titled "Fishers knowledge? Why not add their scientific skills while you're at it?" Many scientists and managers would rather eat humble pie before they would accept this suggestion. Well, the Canadians and Australians realise fishers are equal if not superior in knowledge of the sea. This book must have a special place on the shelf of anyone involved in the management of the seas and make a living from the sea.

Wetland's of Ireland – *Distribution, ecology, uses & economic value*

Edited by Marinus L. Otte

UCD Press

www.ucdpress.ie

ISBN: 1 900621 88 6 (Hb)

ISBN: 1 900621 89 4 (pb)

Price €60.00 (h) €30.00 (p) / 2003

Never was a book so needed to highlight the importance of Ireland's wetlands, many of which are under pressure from building activities, especially in coastal areas and particularly in estuaries. New golf courses have led to the destruction of the upper salt marsh in coastal areas. Possibly the most worrying aspect of the destruction of wetlands is the draining of such lands, much have been filled in and used as waste dumps. The richness of the flora and fauna of Ireland's wetlands is addressed in the many chapters in this book. We read of the importance of salt marshes, coastal lagoons, peatlands, callous and flood plain vegetation of turloughs. Wetlands play a major role as they efficiently retain pollutants from passing through them. They are also important as they act as buffers against floods during periods of high rainfall while during dry spells enhance the water retaining capacity of watersheds. Valuable fish species depend on them for reproduction.

This book is easy to understand and a wonderful present for a family. It is a must for libraries, policy makers, and especially local authority planners.

Carl Linnaeus dressed in Lapp costume.

The man who thanked God for the furze

Celebrating the 300 birthday of Carl Linnaeus

Photo courtesy of Andreas Tregin, Marburg

Founded in 1655, the Linnaeus Garden was the first botanical garden in Sweden. The garden flourishes today with approximately 1,300 species growing in the garden. The plants are all known to have been cultivated by Linnaeus and are arranged according to his own system.

By Daphne Pochin Mould

ON May 23, 1707, a boy child was born to the family of Nils Ingemarsson Linnaeus, Lutheran pastor of Rashuit, Smaland, southern Sweden. The boy would be only the second generation to have the surname Linnaeus, for the Swedes had only just adopted surnames in place of the more ancient system where you are the son or daughter of your father – so the second name changes with each generation. (A system that still works perfectly well for Iceland.) But when Carl's father Nils Ingemarsson went to check in at Lund University, they demanded a surname. The family farm was named Linnegard (Lime tree farm) and there was one particular big lime tree (linn in Swedish) and he invented the Latinised name Linnaeus.

Nils hoped Carl would follow him into the Church but the boy would have none of it. Apart from the family calling themselves after a lime tree, they were all enthusiastic gardeners. It was an exciting time to be a botanist. Ships were exploring the world and coming back with skins and bones of new animals, and careful drawings, written descriptions and dried specimens of new plants. Australia "Botany Boy", a name now more connected with the penal settlements, was named for its bewildering display of plants of many sorts. Botanical gardens were started and tried to grow the new species, as sailing ships brought in seeds, and sometimes growing plants. It was very international – all through the Napoleonic wars, the Botanic garden in Paris exchanged news and specimens with Kew in London.

Young Carl went to university to study medicine (no degrees in botany then) but plants were the love of his life. The family was not rich. Carl was very much a poor boy who made good. He was lucky in finding many like-minded academics who could help him with work and sometimes hospitality. He was a very active writer and his first publication came in 1729, "*Praeludia sponsaliorum plantarum*" on the wedding of plants, for he was fascinated by their sexual arrangements and used it as a system to classify them – to the horror of the more prudish. He was a popular, fun-loving fellow, and a bit of a poet: "The flowers leaves serve as bridal beds which the Creator has so gloriously arranged, adorned with such noble bedcurtains, and perfumed with so many soft scents that the bridegroom with his bride might celebrate their nuptials with so much the greater solemnity". Or his description of *Paeonia lactiflora* (the Chinese Peony) with its single ovary and many stamen "20 males in bed with one female".

He was an active explorer. His first trip was to Lapland, then unknown terrain, organised, but only partly paid for, by the Royal Academy of Science. He wrote up the flora of Lapland and as well picked up enough about mining and different ores to lecture about it in order to make up the shortfall in the trip's costs.

In 1735, he gained his Doctor of Medicine with a thesis on malaria in Holland and its relations to muddy water. Medicine in his day was worlds away from ours, for then there was no knowledge of the life cycles of the many tiny organisms that carry diseases, and a surgeon's skill was judged by the speed with which he could work a knife and saw on a conscious patient. Carl's MD allowed him to marry his beloved Sara Elizabeth Moraea. Their first child, also called Carl, was born in 1741, the same year he was made professor of medicine at Uppsala. He made some special study of syphilis (the "great" pox as against the equally deadly small pox). However the remedies of the time were as likely sometimes to kill as to cure. But the man's heart was with the plants. Carl had experienced cholera on his way to Paris. Wild strawberries were his favourite cure-all.

At this time there were some 7000 known species of plants and 4000 of animals and Linnaeus had the kind of mind that can deal with such numbers. More and more information was flooding in as botanists went further and further afield. Linnaeus had an inner circle of 17 "apostles". One was Daniel Solander who was on Captain Cook's first round the world voyage, that brought the first plant collection from Australia. Pehr Kalm went to America, Carl Peter Thunberg to Japan. And Carl "*Deus creavit, Linnaeus disposuit*" (God created, Linnaeus arranged). Just as English is now, Latin then was the universal language. Linnaeus wrote his numerous publications in it. And with plants, it is still with us. Use an English name to a non-English speaker, and see their eyes light up when you name it in international Latin. But Carl insisted there be only two names to a species, not a whole mouthful of descriptive words. Do you recognise *Rosa sylvestris alba cum rubore folio glabro*? All true BUT unwieldy. Linnaeus cut it down to *Rosa canina*, our lovely dog rose.

Photo: © Robbie Murphy

On first seeing furze (gorse) in flower in the UK, Linnaeus is said to have fallen on his knees and to thank and praise God for that most glorious of plants.

Photo: © Robbie Murphy

Dog rose *Rosa canina*

People had always seen likenesses in groups of plants and animals. The cats from lions to domestic mouser, the various monkeys, or plants that bore pea pods, like garden peas and sweet peas. What Carl grasped was that general likenesses could form a genus and then be broken down into smaller and more closely related groups, until you ended up with one individual species. Thus vertebrates contain the primates and the genus homo, in which is the species *homo sapiens* (humans). Linnaeus' use of the word "species" seems to have been devised by Carl.

Linnaeus' fame was now such that he was raised to the Swedish peerage, taking the name Carl von Linné, and devising a coat of arms. That was in 1757, and the following year he bought a farm at Hammarby. This country home can still be visited today.

But the man was no specialist academic. He saw the glory of God in the splendour of nature. In London, he came on Putney Heath with the furze (English gorse/Scottish whin) in flower and fell on his knees to thank and praise God for that most glorious of plants. But *Ulex europaeus* is a shrub of western Europe. No way would it grow in Sweden. Carl also had hopes of growing tea and coffee there – a ship's captain brought him a living tea plant, all the way by sailing ship from China – and he did get it to flower. But no Swedish tea gardens resulted.

He died in 1778. While nobody thinks of him as a medical pioneer, his botanical work remains very much with us. Meteorologists use his system for clouds, dividing cumulus into its various types and so on. And now, 300 years later, all the world is celebrating the work of the genius, who saw the glory of God in the golden, scented furze.

Tercentenary celebrations of Linnaeus have been world wide especially of course, in his native Sweden.

The Swedish Post Office produced four special stamps and a book about him. Two of them valued at 11SEK each, have two beautifully engraved pictures, on one of the mandrake, *Podophyllum peltatum*, and on the other, the banana, *Musa paradisiaca*. The first day cover has a picture of the snake's head fritillary, *Fritillaria meleagris* and the cancellation has Linnaeus' signature.

At this year's Chelsea Flower Show in London, there was a Linnaeus Garden designed by Ulf Nordfjell, and it was awarded a gold medal. The Linnean Society of London, founded in 1788, holds Linnaeus' botanical and zoological collections and library.

The Floral Clock – Linnaeus had noticed that many flowers open or close at regular times, and that one might make this into a floral clock. It caught the fancy of a French composer Jean Francais, whose *L'horologe de flore* tries to express the flowers in music.

Readers of Patrick O'Brien's naval novels of Napoleonic times will see in Dr. Maturin, very much the Linnean type of doctor, good at doctoring but even more fascinated by the natural world and newly discovered creatures.

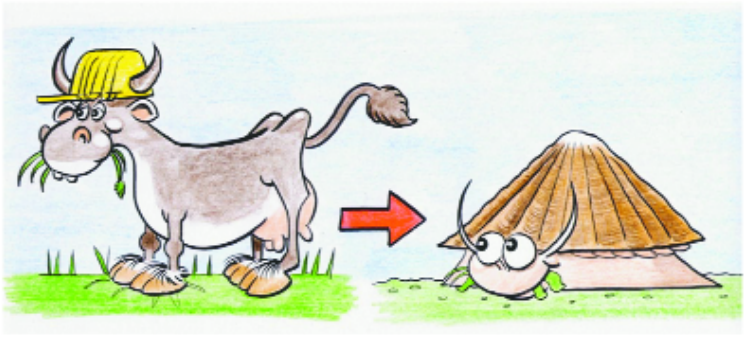
Junior Pages Junior Pages

The Secret Life of Limpets . . .

Imagine a tiny cow with a helmet!
If you look on any rocky shore you'll see small cone-shaped shells stuck to the rocks. These are limpets and the best way to imagine them is as a tiny cow with a huge safety helmet and a large muscular foot.

Like cows, limpets eat plants that they scrape off the rocks. But, unlike cows, limpets have to withstand the heat of the sun, attacks by crabs, birds and fish, and the force of tonnes of water crashing down on them as the waves roll in.

This is why limpets need their shell and their strong muscular foot – just to be able to hang on to the rock and protect themselves!



What's Afoot?
Limpets are members of the snail family and can live to be 20 years old. In that time, their shell becomes perfectly matched to their favourite spot on the rock, forming a watertight seal. So if you knock one off a rock, please put it back in exactly the same place!

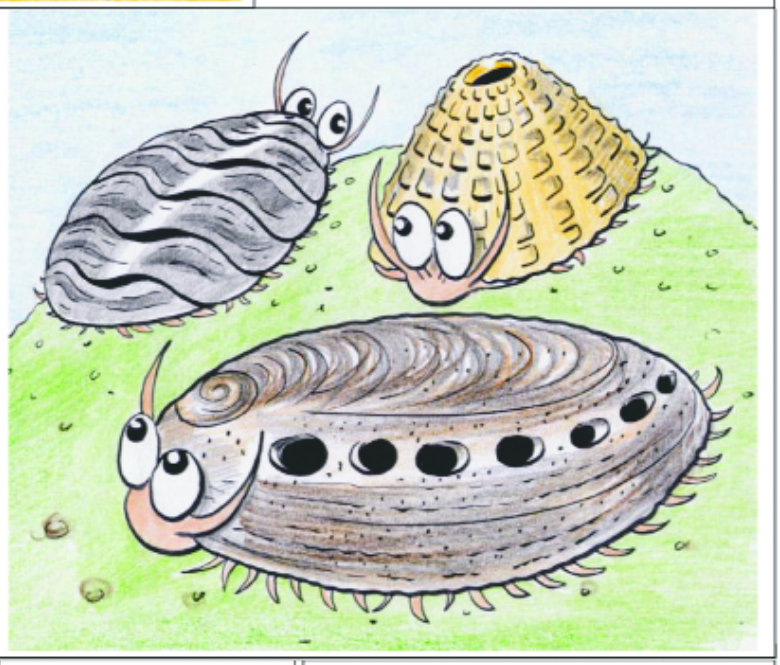
Captain Cockle's Log

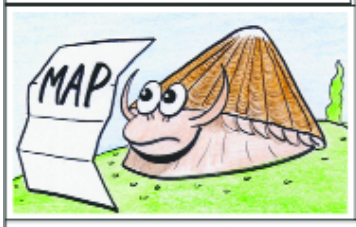
Words & pictures by John Joyce
www.captaincockle.com © John Joyce 2007

Finding their Way Home
Limpets feed at night, moving around their own "territories" on the rocks to feed on seaweed. Sometimes, on a low tide at night, you can actually hear them rasping away at the weed with their file-like tongues.

Limpets will also fight off other limpets they find in their personal "gardens" by bumping them with their shells. But when the tide goes out and the sun and waves attack them, limpets like to be back at their "home" spot, where their shell is perfectly matched to the shape of the rock and forms a perfect seal.

Scientists have now discovered that limpets find their way home by following the trail of slime their foot leaves as they move – which even contains chemicals telling the limpet which way to go.





Books and websites:

A Beginner's Guide to Ireland's Seashore
From Sherkin Island Marine Station
In all good bookshops or online from:
www.sherkinmarine.ie

Discover more online at:
http://en.wikipedia.org/wiki/Limpet

http://library.thinkquest.org/J001418/limpet

The Limpet Family Album
The Common Limpet (*Patella vulgata*) that we find on Irish shores has a number of relatives including the Keyhole Limpet (top right above), which has a single hole in its shell.

The Chiton (top left) has a shell in hinged sections and can roll into a ball like an armadillo to protect itself.

The Abalone (bottom centre) is a very valuable species, not only for the meat on its large foot, but also for the brilliantly coloured shell, which is use to make jewellery.

Abalone are now being farmed in Ireland, which protects the species from overfishing in the wild.

Winter Visitors

By Declan Murphy

NOW that the long days of summer are over, many birds like Swallows, Swifts, Warblers and Wheatears have now flown south to their wintering grounds in Africa. These birds are all insect feeders and although there is food in abundance during the summer months, there are far fewer insects around in the harsh months of winter. Many other species of bird spend the summer months in the high arctic; these include many types of wader, ducks geese and swans and these birds fly south to spend the winter months in Ireland.

Winter is an excellent time to enjoy the delights of wildfowl on our lakes, estuaries and lagoons. The sights and sounds of thousands of geese or ducks on a crisp winter's day is a spectacle not to be missed.

Two species of swan spend the winter in Ireland, the Whooper Swan and the Bewicks Swan, these are often referred to as 'wild swans' as our other species of swan, the Mute Swan, is a resident species and a familiar sight on canals, lakes and rivers.

Whooper Swan

Photo courtesy of Rhion Prichard

The Whooper Swan gets its name from the loud whooping or trumpeting calls it make, they are a very vocal bird and a flock of them can be heard from some distance. They breed in the arctic tundra in Iceland and in northern Scandinavia and Russia, however the birds which spend the winter in Ireland all come from Iceland.

They are slightly smaller than Mute Swans with a slightly longer and thinner neck which is usually held straight but with an obvious kink at the base. The bill is black with a yellow base and is long and wedged shaped giving a very distinctive 'roman-nosed' profile.

They arrive in Ireland in October and leave before mid-April and can sometimes be seen migrating north along our coasts towards Iceland. They are a highly gregarious species and it is very unusual to see a lone bird unless it is injured. Most flocks average about 70 birds but some flocks can include several hundred birds and are known as 'herds'. Although found near water they are usually seen grazing in fields by day alongside bodies of water which they use for roosting at night.

Like many other large birds Whooper Swans are long lived and do not nest until 4-5 years old. Their courtship takes place in Ireland towards the end of the winter and is accompanied by much trumpeting and wing flapping. They are extremely faithful birds and mate for life, when they return in the winter the family party stays together for the duration of the winter months and only split up on return to Iceland. The oldest recorded bird was over 23 years.

Bewick's Swan

The Bewick's Swan is our smallest swan and is more goose-like than either the Mute or Whooper Swan. They have a proportionally shorter and thicker neck than the Whooper Swan and this is often the best way to separate them at a distance, especially if they are feeding with Whooper Swans. When seen close the bill is rounder and square than the long pointed wedge of the Whooper Swan. It also has less yellow on the bill which can appear blacker at a distance. They are a lot less vocal and have a soft mellow yelping call, quite different from other swans. These swans are named after Thomas Bewick, an eminent ornithologist in the late 18th century. They nest farther north than any other species of swan, in northern Russia, and need to complete their breeding cycle in 100-110 days before the arctic weather deteriorates. Considerably fewer birds winter in Ireland than Whooper's with a wintering population of approximately 1,000 birds compared to the Whooper's 8,000-9,000. They too are faithful and mate for life with the oldest wild bird being 20 years old although one bird kept in captivity was over 30 when it died.

Photo courtesy of Arpingstone

Learn about birds with BirdWatch Ireland

Feeding Wild Birds Leaflet
Download this leaflet from the Learn about Birds section on BirdWatch Ireland's website at www.birdwatchireland.ie

Learn how to identify the birds in your garden with our **Free Garden Bird Charts**. Send a SAE to: *BirdWatch Ireland, P.O. Box 12, Greystones, Co. Wicklow.*

BirdWatch Ireland has over 10,000 members and has branches throughout the country which organise events and outings in your area. Why not get your school to join? Write to us or visit our website for details: www.birdwatchireland.ie

BirdWatch Ireland has two educational web sites, catering for learning about birds in schools.

- Visit the Working with Birds web site to learn about watching and feeding birds

Simply go to **www.birdwatchireland.ie** and go to the 'learn about birds' section

BirdWatch Ireland, P.O. Box 12, Greystones, Co. Wicklow.
Tel: 01-2819878 Fax: 01-2819763
Email: info@birdwatchireland.org

Website: www.birdwatchireland.ie

Sherkin Island Marine Station Environmental Competition

for Primary School Children in Munster 2007

YET again Sherkin Island Marine Station had a marvellous response to the *Environmental Competition for Primary School Children in Munster 2007*. Thank you to all who entered this annual competition. It is wonderful to see such creativity and interest in the environment. We had a marvellous day at the prize-giving ceremony at the Carrigaline Court Hotel, Carrigaline, Co. Cork, where Cllr. Tom Sheahan, Mayor of Cork County, presented the prizes.

We would like to take this opportunity to again thank our sponsors for this year. They were: BIM (Irish Sea Fisheries Board), Central Fisheries Board, City Print Cork, Cork City Council, Cork County Council, Dept. of the Environment, Heritage & Local Government, Evening Echo Newspaper Cork, Janssen Pharmaceutical Ltd. and Pfizer Ireland Pharmaceuticals.

Here is a very small selection of some of the 405 prize-winners.

Winners from Scoil Iosagain, Upper Aghada, Midleton, Co. Cork. Cllr. Tom Sheahan, Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present were: Paul Bourke, Central Fisheries Board, Eric Forde, Janssen Pharmaceutical Ltd; Dr. Mary Stack, Cork County Council; Dr. Bridget Lehane, Bord Iascaigh Mhara; Charlie Hipwell, Pfizer Ireland Pharmaceuticals; Matt Murphy, Sherkin Island Marine Station.

Winners from Dangan NS, Co. Clare.

Winners from Glandore NS, Co. Cork.

Winners from Killurney NS, Co. Tipperary.

Checking out some of the winners.

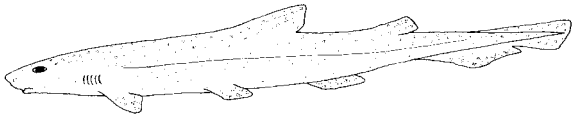
Mermaid's Purse


Photo: © Paul Kay

Mermaid's Purse

When you hear the name "Mermaid's Purse" you might well imagine a fashion-loving mermaid swimming around in the sea. However, in reality Mermaid's Purses are the egg cases laid by sharks, skates and rays in deep waters. Sealed inside the purse is the baby animal, which will continue to grow in there for up to 15 months, protected by the tough walls of the case. These purses often have long, twisted tendrils on each corner, which are used to attach the egg case to seaweed and other floating structures. Brown in colour and often nearly see-through, an egg case is usually only seen when it is washed up on the shore, and then it is often dry and hard. It will usually be empty, as the young fish will have hatched by the time the case is washed ashore.

Purse Search Ireland are on the lookout for mermaid's purses. If you spot one on your next trip to the beach, be sure to report it. For more information read details about the project on page 6 of this issue of *Sherkin Comment* or visit **www.marinedimensions.ie**



Lesser Spotted Dogfish

Scyliorhinus canicula

Fíogach beag

Also called Rock Salmon, the dogfish is a relative of the shark. Like other sharks, it has a cartilaginous (made of cartilage) skeleton and rough skin. It has a long, thin body and a head is rounded. Its mouth is underneath and there are five gill slits on each side. The dogfish is one of several animals that begins life in a mermaid's purse. This case is usually about 6cm long.

Thornback Ray

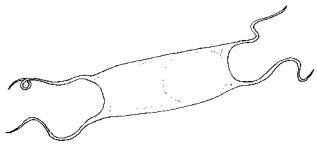
Raja clavata

Rotha gharbh

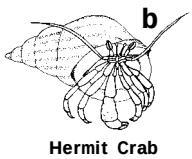
The Thornback ray is probably one of the commonest rays seen by divers. Found in coastal waters all around Europe, it lives in the open sea and in shallow seas. It has a flattened body with wing-like pectoral fins and it looks like a kite, with a long tail. The tail, along with its back, is covered in thorny spines. Its colour can vary from light brown to grey, with dark blotches and darker spots, with yellow patches. Like other rays, it too begins life as a mermaid's purse.

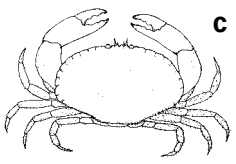
Sketches: © Audrey Murphy

Can you pick out two marine animals that begin life as a Mermaid's Purse?

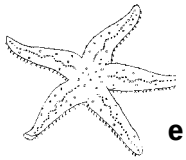


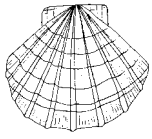

a
Sea Urchin


b
Hermit Crab


c
Crab


d
Dogfish


e
Starfish


f
Scallop


g
Thornback ray

Answer: d and g

Gaisce Gold Volunteers Work in Kenya

Photos: © Sile Kelleher and Therese Geoghegan

Sile Kelleher and Therese Geoghegan hard at work on the project.

By Sile Kelleher & Therese Geoghegan

THE best adventure of our lives so far, Gaisce Gold Adventure to Kenya 2007, in June 2007. This unforgettable experience will be deeply rooted in our hearts and minds forever, simply because, it was a life changing experience for all involved.

The forty strong group of us fundraised money for the renovation of seven classrooms in Wagwer, Western Kenya. From the money raised we also hired local tradesmen, through the Moving Mountains Organisation, to help us achieve our goal within seven days.

We worked closely with the local builders, who taught us how to plaster the walls and mix cement. Our work included lowering the level of the dirt floors so that we could put in a stone foundation and proper concrete floors. Window frames were put in place, sanded down and painted, glass was then put into these. We were astonished by the amount of things we take for granted at home such as cement mixers and running water. At Wagwer, we faced the challenge of carrying water fifteen minutes from the well, a task which the school children were not fazed by as they ran to and from the well laughing and singing. As for the cement mixers…well, we felt it in our arms!

As well as working on the primary school, we camped in and worked with an orphanage in Ulamba, Western Kenya. Here we played with the children who greatly appreciated the toys, clothes and resources that we brought out with us. The majority of these children have suffered from terrible physical abuse and starvation. The different stories of these children touched us all.

In Kenya it is common for children to run away from home and become street kids in big towns or the capital Nairobi. Here they would become involved in street crime and in sniffing glue. The organisation who we were working with, Moving Mountains, works with these street kids. They give them an opportunity to rehabilitate themselves and to earn an honest living. For instance a group of former street kids came with us to work on the school project. Our bus drivers and guides were once street kids also.

School children carrying water for fifteen minutes from the well.

Only for Gaisce, we would have missed out on this incredible and humbling experience. The work we carried out was deeply appreciated and the joy and happiness shown to us was overwhelming. From this adventure we all have everlasting memories.

We would encourage everyone to become involved in Gaisce. Not only do you make great friends but you accomplish great things.

More information from: Gaisce – The President's Award, The State Apartments, Dublin Castle, Dublin 2. Tel: 014758746
Web site: www.p-award.net or www.gaisce.ie
E-mail: mail@p-award.net or info@gaisce.ie

The classrooms before work commenced.

A classroom on completion.

A group of workers involved in the project.

Photo: © BIM

Lemon & Herb Crusted Fish *with parsley mash*

Bord Iascaigh Mhara
Irish Sea Fisheries Board

For more delicious fish recipes visit ***www.bim.ie***

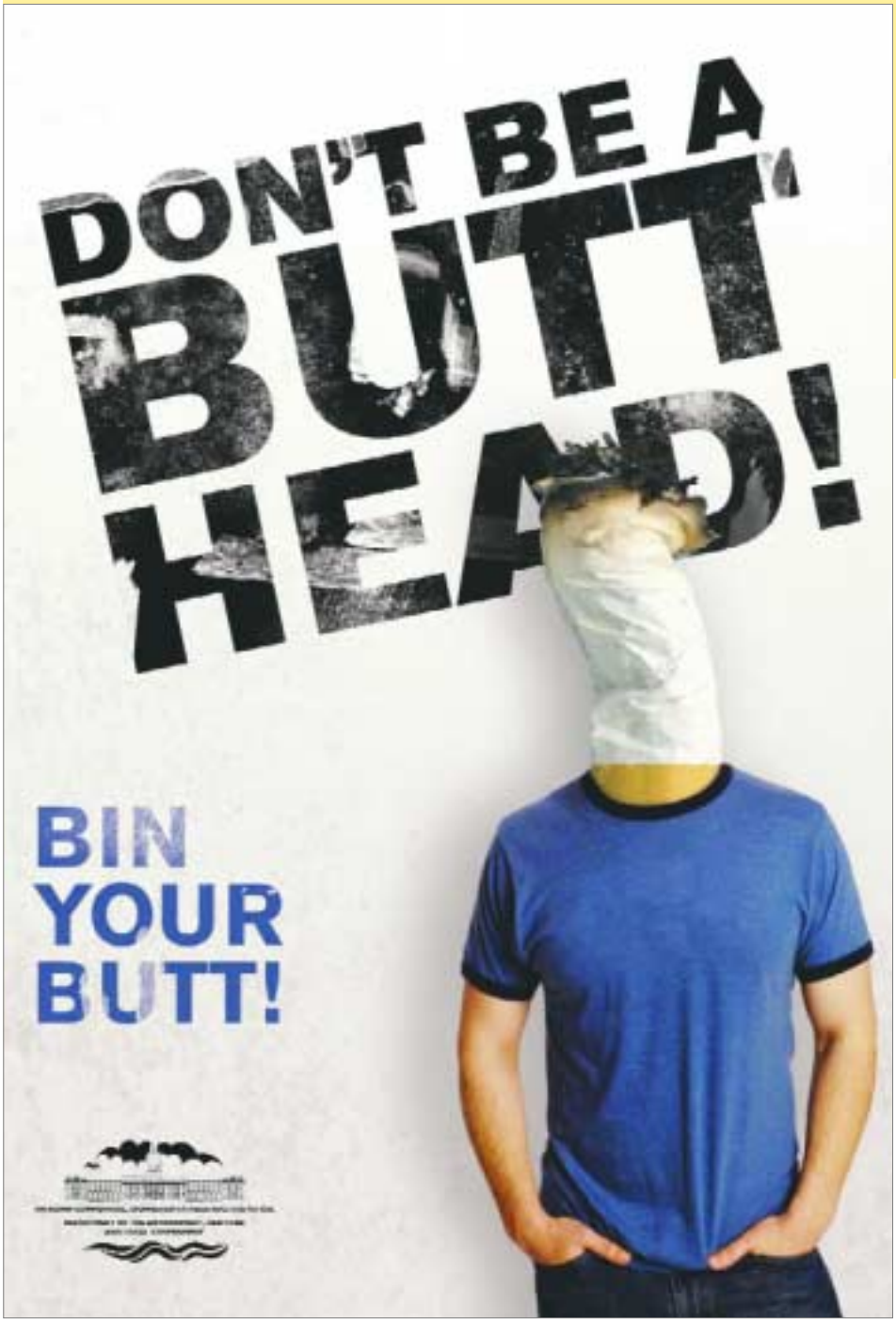
Cooks in 8 – 10 minutes

INGREDIENTS

- 4 large pieces pollock (or other chunky white fish) approx 180g each
- 2 large handfuls of fresh breadcrumbs
- Zest and juice of 2 lemon
- Salt and pepper
- 4 tablespoons chopped fresh parsley or chives (you can also use spring onions)
- 4 – 6 large potatoes, cooked and mashed

METHOD

- Mix the bread crumbs with the lemon juice, zest and most of the chopped herbs, and pat firmly onto the fish.
- Place the fish into a hot oven and bake for 8 – 10 mins, or until the topping is golden and crispy.
- While fish is cooking add the remaining chopped herbs and mix through the mashed potatoes.
- Remove fish from oven. Place a spoonful of mash onto each plate. Add the fish on top and serve with fresh vegetables. *Serves 4*



DOWNLOAD RESOURCES FROM THE RNLI WEBSITE

The RNLI's site for young people is crammed full of exciting activities and games, from seeing how fit you have to be to become a lifeguard, to working out how to successfully launch a massive lifeboat and rescue people using your skills and knowledge. The RNLI is a charity that provides a 24-hour lifesaving service around Ireland and the UK. Their volunteer crews give up their time and comfort to carry out rescues in difficult and often dangerous conditions.

Visit the site at: (**www.rnli-shorething.org.uk**)

There are loads of items to download from the RNLI website, including:

- **"Facts at your fingertips" – a fun, pocket-sized game to highlight the work of the RNLI.**
- **Safety posters**
- **Whiteboard activity games including "Rip Current Beach Safety"**
- **Worksheets for teachers**

The Gulf of Mexico / Mississippi River Dead Zone

Map depicts the 2001, 20,700 km² dead zone in Gulf of Mexico. The zone probably extends farther west, but researchers ran out of money before they could finish charting the area. *S. Norcross, adapted from Rabalais/LUMCON*

By Mike Ludwig

I MOW other people's lawns as a way to unwind at the end of a day. So, I get to watch the annual lawn wars as seekers of the perfect green attempt to out "green" their neighbours. Invariably, someone overdoses their acreage and it's a sandy tan from mid-June to late fall. Too much fertilizer brought on by failure to read or accept the warnings on the label is the standard conclusion. Imagine several million people ignoring the directions about fertilizer use, all along one river and you have the source of the second largest, manmade, annual water pollution event in the world; the Gulf of Mexico / Mississippi River "Dead Zone". The Mississippi River drains about 40 percent of the entire US. And, although it drains the water from states from Montana to New Mexico to New York, including nearly every state between the Rocky and the Appalachian mountains, much of the fertilizer is added along the banks of the "Corn Belt," States (Illinois, Indiana, Iowa, and Ohio) which produce about 50 percent of the US crop. Bad fertilizer management is aggravated by the belief that if a pound will do the job, a little more should make crop growth even better. When several million farmers think that way, only the well fed algae that clog the waterways are happy.

The Gulf of Mexico/Mississippi River Dead Zone was discovered in 1974 by researchers from Louisiana State University studying the Mississippi River and Gulf of Mexico mixing zone. They found from spring through early fall, a dead zone usually impacting an area as large as New Jersey (17,000 square kilometres or 6 to 7,000 square miles) particularly between the inner and mid-continental shelf in the northern Gulf of Mexico. It begins at the Mississippi River delta and extends westward across the upper Texas coast.

When the sun goes down on our happy algae and photosynthesis stops, the plants shift from making oxygen to consuming it. When conditions are right for these simple, floating plants, they are very good at using more oxygen than they made during the daylight hours. And, because they take in oxygen as individual cells, they are better at sucking it up than are bigger beasties. Early in the morning, before the sun rises, the phytoplankton and their associates, bacteria, may have used up most of the oxygen dissolved in their water and created a condition called hypoxia where oxygen levels are below 2 milligrams per litre (mg/l). Normally, dissolved oxygen should be about 8 ml/l to 10 mg/l. On really bad days when photosynthesis is limited by weather or water quality conditions, phytoplankton and bacteria can use up virtually all the oxygen in the deeper, darker water and create "anoxia" or no dissolved oxygen left (0.0 mg/l). Most aquatic animals need over 3 mg/l to survive.

Nitrogen and phosphorous enter the river in upstream runoff of excess fertilizer, soil erosion, animal wastes, and sewage. In a natural system, these nutrients aren't significant factors in algae growth because they are retained on the upland. However, with anthropogenically increased nitrogen and phosphorus inputs rainfall can wash the excess into waterways and algae growth is no longer limited. Consequently, algal blooms develop, the food chain is altered, and dissolved oxygen in the area may be depleted. The dead zone fluctuates seasonally in size, as it is fed or starved by farming practices. It is also affected by weather events such as flooding and hurricanes.

Each year, some 1.6 million tons of nitrogen now enter the Gulf from the Mississippi basin, more than triple the average amount measured between 1955 and 1970. Worldwide, annual fertilizer use has climbed to 145 million tons, a tenfold rise over the last half-century. This increase in fertilizer use coincides with the increase in the number of dead zones around the globe. But agriculture fertilizer is not the only source of nutrients, especially nitrogen, in the river. Manure from lifestock farming and sewage treatment waste water both add to the problem. A US Senate Agriculture Committee report released in December 2006 estimated that 1.37 billion tons of manure was produced by our livestock last year alone, much of it making its way to the sea via the Mississippi River. And let's not forget industrial wastes, and atmospheric pollutants which contribute, also, to the problem.

Forty-three of the world's 146 dead zones recorded in 2004, occur in U.S. coastal waters. The one in the Gulf of Mexico, now the world's second largest, disrupts a highly productive fishery that provides some 18 percent of the U.S. annual catch. Gulf fishers have had to work outside of the hypoxic area to find shrimp and fish. Landings of brown shrimp, the most economically important seafood product from the Gulf of Mexico for American fishermen, have fallen from the record high in 1990, with the annual lows corresponding to the highly hypoxic years

Despite the evidence, scientists remain reluctant to blame the dead zone entirely on farmers: "We're all fairly convinced that it's going to be agriculture that's going to have to kick in and change to some degree to make a big difference," said William Battaglin, hydrologist at the Geological Survey, in Denver, and part of a team tracking the sources of nitrogen in the Mississippi River Basin. "But we don't want to point the finger at the farmer unless we're absolutely sure. He's the one that's going to suffer." Hypoxia may be a standard of living issue," he said. "If we decide not to cut back on our pesticides and fertilizers, we may not be able to solve the problem." It is this attitude that insures things are not going to get better anytime soon!

The world's largest dead zone (70,000 km²) is found in the Baltic Sea.

Read more about Dead Zones:
< http://jeq.scijournals.org/cgi/content/full/30/2/275. > &
< http://oceanservice.noaa.gov/products/pubs_hypox.html >

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