



WALES IN 2050: A VIEW FROM THE FUTURE

MORGAN PARRY

NATIONAL EISTEDDFOD
LECTURE
BALA 2009

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Cover

Morgan Parry seen with his son, nine-year-old Math

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FOREWORD

Dŵr Cymru Welsh Water is very pleased to be able to support Morgan Parry's imaginative IWA Eisteddfod lecture Wales in 2050, since taking the long-term view is embedded in our company's own thinking. Welsh Water is perhaps Wales's largest environmental company, and we are proud of the ethos of trusteeship and public service that our 'not-for-profit' structure – unique in the UK water industry - has been designed to safeguard.

As a provider of essential water and sewerage services and, inevitably, a major energy user, many of the decisions we take today will have a major impact on our customers, the economy and the environment for decades to come. It is, therefore, vital that we operate in a sustainable way and minimise any adverse environmental impacts.

We take much pride in the achievements of the water industry and its partners in recent decades. It is only through very substantial investment that we have secured for Wales one third of all the Blue Flag beaches and marinas as well as the cleanest rivers in the UK. At the same time we have also reduced our abstractions from the environment by a quarter over the last ten years. But we know there is so much more left to do.

In November 2007 we published our vision for the water industry in Wales over the next 25 years in a document Our Sustainable Future. This commits us to deliver even higher quality standards for drinking water, customer service and protection of the environment, as well as to reducing our carbon footprint by 25 per cent by 2015 and by 50 per cent by 2035. In this way we can make our contribution to combating the effects of climate change, such as the extreme weather conditions that can have such a direct effect on our own operations.

This is a very considerable challenge since ever-rising standards have, in the past, meant rising energy consumption as a result of investment in new assets and treatment processes. We now have to find new, more energy-efficient solutions. That is why we have already begun to build advanced sludge digestion plants that can generate power from the methane gas produced, and why we are leading the industry in piloting sustainable urban drainage systems.

This consciousness of the duty of long-term stewardship of one of Wales's primary environmental assets runs deep in the company, but we also want to extend that consciousness to future generations. Our four education centres across Wales are now visited by some 14,000 children every year to learn about the environment and how to cherish it, as well as the crucial role of water in it.

There is no doubt that climate has shaped Wales, as it does every country, perhaps more than any other single factor. It has shaped our landscape and history and who we are as people. Whatever climate change holds for us in future, Welsh Water is determined to do all it can to deliver to future generations the best possible outcome within its power.

Nigel Annett, *Managing Director*
Dŵr Cymru Welsh Water

PREFACE

I had conflicting thoughts and emotions when John Osmond invited me to give the 2009 IWA Eisteddfod lecture. I had spent nearly ten years working alongside the Welsh Government trying to get to grips with this idea of ‘sustainable development’ and wondering why it was so hard to communicate the urgency of the problems we face. Traditional lectures about such things can be very dry: could imagination succeed where scientific evidence has not?

It was easy to get long-term targets in Government plans, but much more difficult to get them, and us, to act now in a way that would secure our future survival. Increasingly, 2050 became the date at which everything would somehow happen: in particular, with the massive threat of climate change, 2050 was the date by which we would reduce significantly the greenhouse gases we add to the atmosphere and start living within the limits of our one planet. The Welsh Assembly Government was doing better than almost any other government in the world at understanding the problem, and describing plans and strategies for what needed to be done. However, I became less and less sure that we would do it, because the date was such a long way in the future and we are all creatures of bad habits, living for today. We don't notice, or care about, or respond to, small incremental changes until it is too late to do anything about it.

Spending time with my son Math one day earlier this year, around the time of his 9th birthday, I realised that he would be the same age in 2050 as I am now. If only we could travel into the future to his 50th birthday, and he could describe his life and the times he was living in, we could discover whether we'd succeeded with our great plans, or whether we were still rolling along in a handcart to hell.

Forecasting the future is a risky business, and readers are more likely to find fault with my scenario than they are to agree with it. Our world is infinitely complex, and the future is unknowable, with many interacting forces, actors and events determining the path we will follow. In a 40 minute lecture I am forced to ignore a myriad of social and economic influences. But a piece of future fiction can be thought-provoking and (in the case of Islwyn Ffowc Elis or George Orwell) can influence the national debate or even the course of events. I have none of the literary skills of those great authors, but I do have some knowledge of science, and I have immersed myself in a study of our current predicament. I want to remain optimistic that we as a human species can overcome our problems with inventions and adaptations, and I want to see Wales survive and flourish.

This lecture uses as its starting point the best scientific evidence available today, and the most realistic trends based on that evidence. The evidence and trends have been endorsed by governments in Wales, the UK and elsewhere in the world. Of course, extrapolating trends into forecasts of the future cannot be anything other than a subjective exercise. Yet it seems to me that this is one moment in our history when we need a little imagination.

A VIEW FROM THE FUTURE

As I look back on my first 50 years, I'm amazed we survived at all! I remember when I was a young boy my father coming to speak to my school, telling us about how we were polluting the planet, about how the earth was warming, causing droughts in Africa and hurricanes in America, and how we needed to do something about it quickly. I was too young to understand much at the time. I knew my dad was worried though. I do remember a very hot summer when we had to stay indoors during the middle of the day, the grass died on the lawn, we splashed in the plastic pool and had ice cream every day. Other summers were cool and wet though, the fields were green and the hedgerows full of fruit.

My friends all thought Dad was a nutter, who made us walk to school while they all went the mile in their 4x4s. Sometimes my sister and I would take ages getting dressed in the morning so there was no time to walk, and Mum would have to drive us there. But we got fit and strong and as the roads got clogged up with cars, we'd ride on the cycle path and laugh at people stuck in traffic. We used to love going camping, even though sometimes we were jealous of our friends who flew to Disneyland for their holidays. I got really interested in nature, collecting seeds and fossils and crabs from Dinas Dinlle.

On warm summers days we sold our honey and eggs at the gate by the road. We kept the money in a jam jar and rode horses at the local stables. We had our computer games and television too, but it was those innocent outdoor joys that would set us up for life.

2010

My Mum had planted an olive tree against the wall of our house and this year we had fruit for the first time: the neighbours came to look at it, and we got our photograph in the Herald because it was the first olive tree in the area. Mum said it could grow there because the weather was warmer, but my sister ate some of the olives before they were ripe, and she was sick.

More people came to our area on holiday in the summer, and Pwllheli was always full when we went to see Taid. We swam at Dinas Dinlle every day, but I liked it best when the school holidays were over and the tourists were gone.... we had the beach to ourselves.

I've got an old photograph of my sister and me in the snow one winter, sliding down the field behind the house on sleds, and another with a snowman. I don't remember another winter like that..

2011

Things started getting bad the year I went to secondary school. I remember my first day, the tarmac on the school yard melted and stuck to my shoes, and we had to stay indoors at lunchtime in case we got heatstroke. My dad said it was the hottest year ever, even hotter than 2006. Taps in England dried up and tankers took water to London from Llyn Cwellyn. We did a school project on the drought in Spain and the fires in Australia.

Florida had been hit by a massive hurricane, when my best friend Dafydd was there on holiday. He'd sent me a message before he went to bed saying the storm was coming. I remember because the ring tone woke me up at two o'clock in the morning. I'd got a mobile phone (remember them?!) for my birthday and I'd taken it to bed without telling my Mum. The next day we heard that the house where he'd been staying had been submerged by the sea, and Dafydd's little sister Gwen had been swept away, along with many other people. The memory still haunts him to this day, and we talk about it often. We've stayed close, and lived through many things together.

I think what happened next was a real turning point here in Wales. It was 2011 and there was an election to the Welsh Parliament - it was called an Assembly in those days - and there'd been a huge fuss about new motorways and airports, with some people saying we needed them because they helped our economy. Other people said the climate was more important, and that the economy would be fine. The storms and heat waves had worried the politicians, and a coalition came together and won

the election. Looking back, we in Wales took some wise decisions in the years that followed. My father told me a new era was about to dawn.....

2012

Wales joined other countries at a big conference that tried to stop the pollution, but no-one would agree. The Chinese and the Indians said we'd started the problem and that we were already rich: we told them they had to stop burning coal and polluting the planet. President Obama had tried to sort it out in 2009, and again three years later, but there was still no deal. Some people said Wales shouldn't try to be different from everyone else but our government had done its sums and knew what would happen if we carried on as we had been. Our new First Minister said Wales would lead the way.

I remember a debate in class about windfarms, with half the class in favour and the other half against. We'd been on a school trip to see a new farm near Cerrigydrudion and I thought they were brilliant. Some of my friends' parents had been trying to stop them, and the class voted against them. Looking back though, those early windfarms made us more aware of where our energy came from, and we learnt to use it more wisely. By now the big wind farms have almost all be taken down, and new technologies are much better. But if we'd waited, and not built what we could, we'd have been in a far worse situation today.

When I left home this morning to come to Bala, I checked the weather record on Y Byd datastream. The year after that big meeting of governments was the hottest ever, and hundreds of thousands of people died in Africa. The United Nations started making plans for moving people from there to cooler countries further north.

2014

I got interested in science at school, I loved doing experiments. I cycled everywhere, and other people were doing the same. We had a car but we didn't use it much, because the buses and trains were getting easier to use. We'd just got out of a bad recession where lots of people lost their jobs - including my dad - but it seemed things were getting back to normal.

So I had to read the history books to discover that some small but profound things happened in Wales at that time.

In Wales, the recession had made everyone think again about being in debt, and it was like we lost interest in shopping. Old ideas about wealth

and progress were challenged when a new group of young economists became influential with government. People started saving more money in pension schemes, and investing in local bonds instead of banks, and public services improved.

The European Union (strange how that name has survived!) changed the rules on agriculture, and Welsh farmers adapted. We began to realise how important the land was, and how vital it was that we managed it properly. We started growing more of our own food, as farmland throughout the world disappeared under cities and energy crops. Flying was becoming expensive and imported food got dearer as a result. So we paid our own farmers a little more for their produce. There was great demand for our lamb and beef in Europe, and its quality was well known.

New local shops and markets opened up and the money stayed in the towns and villages. Some people moved to the cities but most of my friends stayed; incomers bought smallholdings and set up businesses.

In some other countries, people ignored the warning signs, and carried on regardless.

2015

When the City of London said they wanted to build a new dam in the Elan Valley, everyone started talking about water. I'd been staying at Glanllyn that summer and the swags were singing songs about it. There was a big protest in Cardiff, but it was the Government in London that had to take the decision. London was running out of water and some very dry summers had led to rationing. People were angry, and refused to pay council taxes, and the city was at a standstill.

A big company tried to buy some of the largest farms in Montgomeryshire and Denbighshire but the owners refused to sell. This turned into a big scandal when it became known that the company was backed by Chinese banks and was also buying land in Africa, south America and eastern Europe. We'd been selling our beef to China but with their growing population the future was uncertain, and they wanted to control the production of their food.

Land and water were big political issues. We voted in a referendum to have a Parliament with full powers to make laws. The Elan Valley dam and the farm buy-out threat had been one of the main reasons why people voted yes. My mum got elected to the council and lots more people took an interest in how the changing world was affecting us. But we also knew that our lives would be closely tied to the people of the other nations of Britain and abroad, and that we'd have to work together to overcome some big challenges.

2016

It was a happy place and time to be a teenager in ‘Y Fro Gymraeg’ in the 2010s. I played bass in our school rock band and had trials for the North Wales rugby region. I wanted to be a scientist, or maybe a chef, I loved cooking food I'd grown myself. But I was beginning to see that other countries were not so lucky, and I helped raise money for projects in Africa and protested against wars in far off places.

The price of oil was higher than it ever had been before, and petrol prices went up again. Remote rural areas got help through reduced taxes, and car sharing got well organised and buses were free so poorer people didn't suffer.

With the price of fuel, fewer people were driving to the Eisteddfod. It opened on a permanent site near Bangor that year, and the following year in the centre of Cardiff. The money it saved went to hundreds of local eisteddfodau around Wales, and more and more people took part.

We'd had storms, but not as big as the one on the night of my 17th birthday. A big flood drowned a town on the coast as storms came in from the north. Thirty thousand people lost their homes. Sea walls collapsed and the A55 was closed for months afterwards. We started thinking that the coast could not be saved.

2018

I got my first job in Cardiff with a company making solar films. A Welsh scientist had discovered a way of making extracts from a genetically modified seaweed into a new kind of electrical battery. The same substance inside a plastic film could be moulded onto the roofs of buildings and worked as a cheap solar panel to generate electricity, and the patent had been given to a Welsh company. They then set up factories across Wales to make the films, and licensed other companies around the world to do the same. The company was called Danhaul and it grew to become the leader in this new technology.

Other companies sprang up around Wales in our university towns, building wind turbines, tidal generators, biogas plants and heat pumps. Local builders were trained in new methods and materials.

Our capital city Cardiff had been growing rapidly but with the increase in the price of oil a different kind of development was taking place, as we became the best at building energy efficient houses. I lived on a new estate with lots of other young people, and all the houses were connected to district heating and cooling systems, which used waste from farms and forests. We had wind turbines and of course a solar roof, and we got a mortgage from a community

bank at very low rates. The company that built the houses got contracts in Europe and was employing thousands of people back home doing up old properties. They were years ahead of everyone else in doing this.

Arguments about a barrage across the river Severn were still going on, as demand for electricity increased and scientists told us to stop burning coal. But many countries in the world were removing dams from their rivers as flooding became serious and fish like salmon and trout became scarce.

I got involved in an action group to stop the dam in the Elan Valley. Although the Government in Cardiff had the power to say no, they were offered good money by the private water companies that wanted to build the dam and sell water at a profit to Londoners. A deal was agreed, and construction began.

2020

China suffered badly from the big global recessions of 2009 and 2014, as its export trade collapsed. Millions of people who had moved to the cities in the first years of the century to work in factories, moved back to the countryside when we in the West stopped buying their goods. But their farming had changed, they grew feed for their cattle using massive machines, and there was no work for the villagers, and many starved.

Our farms in Wales became more diverse but stayed small and family owned. Welsh people began to return from the English cities to set up new businesses in the country, as did many English and more and more people from overseas. A large area of northern Scotland was bought by an international investment company, and sheep ranching replaced the small tenant farms. There, the rural population got older, and sons and daughters moved to the cities.

Danhaul thrived, and we set up a subsidiary that bought up the big energy companies that supplied Welsh homes. Surplus money went back to our customers, and we managed their electricity use as well as how it was generated. A million people subscribed to our services and with the money that was raised we set up a fund for renovating old houses. The Welsh Government raised income tax by one cent in every Euro, and matched the company's investment. Ten per cent went to Africa to build new homes and hospitals there. The fund also paid local councils to build high-tech conference centres for people to work from, and bought land down the west coast to build a fast railway from Bangor to Cardiff. It was known as the Green New Deal.

I remember Taid telling me about President Roosevelt in America, and his New Deal. Nearly ninety years later Taid got his house refurbished and

rewired so that everything was computer controlled, electricity bills halved and no heat was needed except in the winter. Because the Welsh Government had started with houses in the poorer communities first, and with elderly people, it became a very popular scheme. In England, private power companies continued to put profit first, there was no work done on old houses, and the cost of living was high as oil prices soared.

2022

The price of oil doubled again in 2022, lorry drivers protested and there were riots in some English cities. It affected us, too, and people were worried about the future. But we knew it was inevitable: the end of the oil age had come. Hospitals and schools got first call on supplies. But the house renovations continued and new non-polluting buses came in and were subsidised by the government.

We couldn't blame the oil companies for being greedy. Their profits were gone, spent on looking for new oilfields that didn't exist. As riots got worse, a Government Minister was attacked in a London street. Some cities in Europe stopped working and shops emptied of food, but in other countries new enterprise boomed and we learned from them. Airlines went out of business and fewer and fewer people were flying. But electric cars were becoming popular. World trade slowed, and it seemed that globalisation went into reverse for a while.

We had fuel ration cards, so if we wanted to travel anywhere by plane we had to buy someone else's ration as well as the price of the ticket. A flight to Australia took a whole year's ration. Taid told me about the war, when everything was rationed. I've still got his ration book. He said this was worse than the war, because we knew oil wouldn't be coming back. But in other ways I could see how life could be better.

In the rural areas of Wales and in the towns, community farms grew rapidly, selling food in the summer through local markets. Supermarkets still shipped some food in from overseas, as we do to this day, but they now bought more from local farmers. India's population had doubled, and food was short. But we in Wales had sown the seeds of our future survival.

There was another oil war, this time in Africa, as the new superpowers expanded their empires, and a water war in Palestine changed the map of the Middle East forever.

2024

A recession followed the wars, and in many countries businesses closed and unemployment returned.

I became a director of Danhaul, and the company grew as Cardiff was transformed, but I longed for something else.

Farming was popular and profitable, and for the first time in a hundred years herring was caught in large numbers off the Welsh coast.

I might have been wrong about the Elan Valley dam. Water had been a public resource in Wales, owned by everyone, with no-one profiting, and selling it felt wrong. But in an age of shortage we had assets we could share, and for London, buying water from Wales was cheaper than moving its people out of the city. This wasn't like Trewern in the 1960s. No villages were drowned, and the income from the sale of water was invested wisely.

2026

Warmer winters meant that fewer old people died of cold. But we'd also lived through pandemics and epidemics, which killed millions of people worldwide, and skin cancer and malaria had increased in Europe. But it was the 'secret epidemic' that hit us hardest. Emotionally, many of us were suffering, but we were hiding it away. I missed my family and the networks of friends I'd had at home. I was lonely, isolated and unhappy. I wasn't alone.

When everyone saw what was happening, there was a great emotional re-awakening. We started to think about our lives, and what made us happy. It wasn't a religious revival like in earlier times (my Nain used to tell me about them) but it was as if everyone decided together to do things differently.

I stayed in the city though, and the company let us work shorter hours. We spent more time with our friends, and went for bike-rides and walked in the hills. Allotments sprung up where old houses had been cleared from the centre of the city, and we started growing our own food.

A Buddhist revival swept China, the biggest country on earth. Within a few years the country rejected the consumerism of the west and began to follow a different path. This would have a profound impact worldwide for years to come.

I went back to college to learn the new farming, and was amazed to meet people from all over the world that wanted to study here. Our colleges had the best courses and produced the best qualified graduates and the best research scientists and the most talented artists. Foreign students went back home with fond memories of their stay in Wales, but many stayed.

On the day a massive wind and tide farm in the Irish Sea was connected to the supergrid, our last coal power station closed down. All homes in Wales were powered by the wind and the new solar films. Tidal generators powered ports and factories. But heavy industry was still hungry for power, and a steelworks in south Wales was built with a new type of nuclear power plant to fire its furnaces, and waste heat was piped to local homes and workplaces.

Scientists discovered a big rise in CO² in the atmosphere, which later turned out to be from a failed experiment to bury the gas under the North Sea. The gas had leaked to the surface and the sea above turned to acid.

London stopped growing that year, as it couldn't support more people.

2028

We cracked the problem of waste that year. From then on, nothing got thrown into holes in the ground. We recycled everything when it wore out, and stopped making anything that couldn't be reused or repaired. We used new materials and processes, and instead of burning what oil we had left, we made it into incredible plastics and polymers that were reused and recycled, and we used wood in clever new ways. Processes that used a tiny fraction of the energy and materials of what went before were needed everywhere. Welsh companies had developed some of the best and our engineers were in demand throughout the world.

Farming changed in Wales as the summers got hotter. Grasslands that once had millions of sheep had become mixed farms again with crops, vegetables and fruit grown where the soils were deep and fertile enough. Although sheep and cattle were still kept, plantations of willow and poplar were also grown to supply district heating schemes in local towns. Natural woodland was returning as well. On the higher ground, bogs and wetlands were restored to hold heavy rains and stop flooding in the valleys. Every small farm had its own reservoir and irrigated cereal crops, vineyards and olive groves. These had been paid for from the sale of water to London.

Wildlife thrived as the landscape changed, but some plants and animals disappeared forever. Curlew and lapwing had gone but new species came in from the south. A plague of beetles had attacked our native oak trees and left a lot of the western hills bare, and soils had washed away in winter storms. I used to climb mountains when I was a boy and once saw the Snowdon lily in flower. According to Dei Tomos's autobiography, the last one disappeared the year I was 28 years old. Going home at Christmas, I used to look for snow on Yr Wyddfa, and cry to myself at what we had lost.

I met a girl from India who was studying with me, and we lived together

in Canton. She was from a farming family in West Bengal who had abandoned their land to the rising floodwater. Mum and dad would often come to stay with us, and be young again in the big city. Sometimes Chandra and I would go to Rhos Isaf for the holidays, and chop wood for the furnace. The furnace heated water and cooked food, with no smoke or waste. Dad had planted the trees before I was born, thinking even then that the oil would run out. For every one he chopped down, he'd plant another three in their place.

2030

I have an old photograph of the house where I was brought up. Tan y Bryn was a rough stone cottage, a hundred years old by the time I was born, heated by coal for most of that time, then by oil when I was a boy. It's amazing to think now that we would burn oil to heat a building. We used to waste so much energy back in those days when fuel was so cheap. When the third oil war started, the price went up far more than most people could afford, and we gave up using it completely for heating buildings. A lot of the old houses were pulled down and new eco-cabins were put in their place, but Tan y Bryn was still standing, cool in the summer with its thick stone walls.

Water became the lifeblood of Wales. With longer growing seasons, crops could be grown that previously couldn't. In eastern Powys, Denbighshire and rural Wrexham grass turned to cropland and was irrigated from reservoirs. But in eastern England the rain stopped completely in summer months and agriculture became difficult. Groundwater dried up and towns and villages were abandoned, and the population moved away.

We grew our food more intensively with fewer chemicals, and crops were more valuable than animals as our diet changed. The reservoirs we'd built were well used, and the rivers kept flowing. As well as solar films on old roofs, we collected rainwater in tanks which we used for everything except cooking and drinking. We planted trees and gardens in towns, soaking up storm water and preventing floods.

2033

Heather moorland became rare as summer droughts dried out bogs and fires were more frequent. Oak woods returned slowly but the richness of past times was gone.

Around the world tropical rainforests were dying, as monsoon rains failed for the third year in a row. Dying trees in the jungle added to the gases in the atmosphere that were slowly but surely baking the earth. In a remote part of the Canadian arctic, the last of the polar bears began adapting to life on land. The ocean drowned farmland in Bangladesh, and Antarctica melted. Hurricanes worsened in central America, and some countries gave up hope.

We celebrated the census results of 2031, as half the people of Wales were now speaking Welsh every day. Many different nationalities were coming here to live, with many private languages, but a strong sense of Welsh identity grew amongst the immigrant population and our language was cherished as the nation's public tongue.

The Scots Gaelic language clung on in remote islands, but with farming unchanged since the last century and the landscape denuded, the rural communities withered and died.

I left college with an aching desire to go back home, and live near the mountains. My parents were getting old and they wanted us to take over the three acres we knew so well, despite all the changes of time and season. But the old village had become part of the town, new houses were everywhere and it was time for a new start.

2036

A barrage across the River Severn had been built at huge cost, a concrete dinosaur from another age. It never generated any power, and caused a legal battle between the English and Welsh governments. England had built a new airport on an island behind the barrage and the city of Bristol became a massive metropolis of badly built houses and shops no-one wanted. The aeroplanes became fewer and the shops all went bankrupt, and big problems started with the barrage. With more winter rainfall, soil was washed from the hills and settled behind the turbines, making them useless. Ships couldn't use the river and fish died out: the people of Cardiff had had enough.

At the European Court, judges agreed with the Welsh Government, and the dam was blown open to restore the river. Years later, some fish would come back, and super-efficient underwater turbines would generate all the electricity of Cardiff and Newport.

I got married that year, to a woman called Megan. She wove beautiful fabrics from goats wool and had started a credit union for young people. Her family farmed oysters in the Afon Menai. We built a house on a hill near Bangor, not far from where I grew up, with a timber frame and solar roof. Many people had come up from the coast to create a community for

the future using the best of our traditional knowledge and the newest technology. In a few years, thousands had come from all over Wales and abroad, and a new Welsh city was born.

2042

The hottest year ever, and the science data-memories say it was caused by a massive build up of methane in the atmosphere. The frozen lands of northern Russia thawed, the deep water of the oceans warmed, and the gas was released.

England's croplands were dry as summer temperatures reach 40 degrees some days every year. Thousands of Welsh emigrants came back from the cities of England, and the population of Wales had grown. The immigrants that arrived from eastern Europe earlier in the century had gone back but the new immigrants were fleeing from much worse conditions. India resettled millions of people as water flows from Himalayan glaciers stopped and farming was abandoned. More than 500 million people had to move from the Ganges delta in Bangladesh as land was abandoned to the sea. Under a UN programme, half a million people of these people were settled in Wales and Scotland.

2050

I've just bought my daughter a second-hand hoverpod. She's going to Prifysgol Aberystwyth in September and although it's great to have the electric railway all the way down the west coast, teenagers like to be independent!

My parents passed away within days of each other. So I went back to Rhos Isaf last week, to sell the land and demolish the house. I promised my dad that his trees would survive, and the bees which are all descendents of the same ancient colony. The land and the trees are worth more than the house, but we'll build new modular dwellings which suit the new climate.

Old Mr Jones came by while we were there. He still lives down the road and has always been an uncle to my sister and me. He still looks after the energy farm which he built when he retired, and charges everyone's electric car in exchange for fresh food. He put an electric motor in his Fergie Bach and still drives to town in it, shouting at people who don't hear him coming!

We get less rain in summer, and it comes in massive downpours. It's over five degrees hotter in the middle of summer and the sun dries out the fields, except where the reservoir feeds the vineyards and olive groves. There are

still sheep on the hills but summer grass is poor. It's a different country now, but the house names remain from a bygone age: Ty'n Ffrwd, Ty'n y Weirglodd and Glan Gors, with no reference point in the new landscape.

But the changes we in Wales made when I was a boy keep our hopes alive today. We adapted before the climate changed and the oil ran out, and understood before anyone else what we had to do to survive. Some countries weren't so lucky.

How did the language survive? Was it luck or the foresight of my parents' generation? Mass migrations of people swept across northern Europe from Asia and Africa, and the cultures of many small nations were overwhelmed. This had started to happen before the climate changed, as globalisation gave us the benefits of free trade and the curse of mass culture. When trade broke down as oil disappeared, and wars were fought over water and land, there were winners and losers.

Many came from Catalunya as the Mediterranean coast became uninhabitable. They recognised the importance of our language and became fluent. They were settled in new cities away from the coast. Farmers from Bangladesh and north Africa brought new ideas and respected our traditions. Instead of losing ground, the Welsh language gained a million new speakers but our idea of what is Welsh changed forever.

We've become a more equal society, more humble, more reliant on our neighbours and the sustaining power of the land. We are active and healthier and our food is very different. We have Welsh lamb on holidays, but other meat is grown artificially in factories and tastes disgusting. There was no way nine billion people could all eat meat like we used to.

I live in the new city of Porthmenai. It's built in the hills above the old towns of Bangor and Porthaethwy with the Menai Strait between. The best of old Bangor will be kept - the college on the hill - but we'll lose the rest. Many old towns of north Wales have moved inland or uphill as the water started rising. It's slow so far but the oceans will grow for centuries into the future and it's a battle we can't win. Like Seitheny, we all failed to keep watch:

Trwy ofer esgeulustod
Y gwiliwr ar y tŵr
Aeth clychau Cantre'r Gwaelod
O'r golwg dan y dŵr.*

Porthmenai is a city of super-efficient solar buildings and new-age transport powered by the sea. No waste is produced, no water is lost, and the Menai Strait is full of amazing sea creatures. My children roller-skate to school with

their friends, and we buy food from the city farm. I took over the oyster business and we sail the coast selling the shellfish.

The little electric train from Bangor to the Eisteddfod here at Bala came through Caernarfon and Porthmadog and took 40 minutes. Living in the new city, we don't need private transport, but we borrow an electric car or a hoverpod when we travel to the country.

My sister Martha lives on a farm near Corwen, and we go over to stay at weekends. On cool summers days our kids sell our honey and eggs at the gate by the road. They keep the money in a jam jar and ride horses at the local stable. They have fantasy games and virtual reality too, but the innocent joys of nature will set them up for life.

Did you hear the news this morning? The new airship flies for the first time today, with its hybrid solar/fuel cells and its helium ascenders. Its taken years to develop, but now the dream of global travel is back, this time at no cost to our future.

The worst is not over, of course. The pollution we put into the atmosphere a hundred years ago is still warming the earth. The seas will keep rising, storms and floods will get worse, and much of Africa and Australia will become desert. There are half as many people again on the earth, as there was when I was a boy. But we've stopped living as if there's no tomorrow, and it feels like a new era is about to dawn.....

* Through neglect and carelessness/ of the watchman on the tower/ the bells of Cantre'r Gwaelod/ disappeared under the water. In the Welsh legend Seithenyn was tasked to close the gates in the sea wall protecting Cantre'r Gwaelod (low lying land off the present day Cardigan Bay coastline) when the tide came in.