**CLIMATE CHANGE**

**A talk by Prebendary Michael Kneen given to Leominster Deanery Synod at Cedar Hall Dilwyn on Thursday 27th September 2018**

Climate change! This is an enormous topic and I could talk about it for a very very long time. I'm not going to do that. I want to talk for maybe 25 minutes and leave some time for you to come back with your own ideas, opinions and questions. So I'm going to try to limit myself and only say a small part of what I personally could say. The principles behind what used to be called global warming and we now refer to more often as climate change are really very simple. If you burn any carbon-based fuel or substance - whether it be beans on toast inside us, or coal going into a power station, or the petrol or diesel that goes into your car - if you burn that in air you'll produce carbon dioxide: a tasteless, invisible, odourless gas somewhat heavier than most of the components of the air, which in very small quantities mixed up in our atmosphere can act as a sort of a duvet, a blanket if you like, around our earth which helps it to retain a certain amount of heat; and, to a large extent for most of the last few million years, that has probably been a very good thing.

One thing that's happened since Victorian times and just before perhaps is that there has been a vast increase, an accelerating increase, in the rate at which we pull ancient fossil carbon in the form of coal, oil or gas from the ground and burn it; so the rate at which we push carbon dioxide into the air has hugely increased, and on such a massive scale that it's starting to increase the percentage concentration of carbon dioxide in the air. and as that's happened so there have been the first signs of a gradual rise in temperature. This effect was known about a long time ago. In the early to mid-1800s there were people who predicted this sort of effect and I suppose it's really since the second World War that people have started to become seriously concerned about what might happen if we allow this process to go on unabated.

The earth can cope with quite a lot of carbon dioxide. It can cope with the carbon dioxide that comes from our breathing, from animals, from plants that decay, all of this sort of thing. The problem is the vast amount of carbon dioxide that we throw into the air as we burn lots of fossil fuel. You'll know, of course, that trees and plants absorb carbon dioxide from the air, so that there is a mechanism by which carbon dioxide is slowly and steadily taken away. The problem perhaps comes as we increase the concentration and it goes up and up and up.

There's another gas as well which we probably should have some concern for and that's methane. Methane comes to us as a gas fuel; and oil and gas drilling release a certain amount of methane. There's also a huge amount of gas that leaks from gas pipes. There's also methane that's produced by rotting rubbish. Lydia - your Michael and I have talked about that and thought what fun it would be if we could take some of your slurry and ferment it to make methane, not to put into the atmosphere but actually to use as a fuel. That's one of the things that increasingly happens in this country at the moment and 2% or 3% of our energy is being produced by fermenting either carbohydrates or waste food, so it's a useful thing to do. Methane in the atmosphere however is not so good: it is much more intensely insulating than carbon dioxide is although the good news is that it disappears from the atmosphere quite fast.

President Obama, being aware of this advice from his scientific community, passed resolutions in the United States to limit the amount of waste methane that would simply let off into the air. President Trump believes that the oil and gas companies are so poor and desperate that they need to be allowed to have these regulations relaxed. It's too much of a burden for them and so Mr Trump thinks it would be perfectly all right to let methane leak from their pipelines like billy-o.

If the earth warms due to man-made climate change as a result of carbon dioxide and methane, even by a little, unwanted things start to happen. We can cope with an enormous range of temperatures. Those of you who have children or grandchildren probably still relish getting on your warmest togs and going out with them on a suitable day at -5 to build a snowman; or some of you like me (not so much now - the knees won't cope with it) have probably had enormous fun in the Alps whizzing down hills on planks. Skiing is the best way to get from one bar to another I find in January, and the sun is absolutely wonderful; right up to the other extreme where you sit with your t-shirt and your glasses with something cooling by the pool at 40° centigrade in southern Spain or wherever it is that you go, or at various points of the summer in Leominster. We cope with all of this but let your body temperature, your internal temperature, go up by just one degree and you're in trouble. The doctor is sent for, a whole packet of paracetamol - well no, not all at once please - has gone into you if you try and control the temperature, and you feel absolutely ghastly.

Very, very small variations in temperature or some other variable have an enormous effect, and so it is in the case of our climate. The sea water in the Gulf of Mexico is about 1° warmer over this last year or so than the historic average. It's thought that it was that additional warmth, 1° centigrade, I'm always thinking in terms of degrees centigrade - one of your old Fahrenheit degrees is approximately half a degree centigrade - but if you like to think in terms of the centigrade system then 0° is freezing, 100° is boiling, 37°-ish is our body temperature, 38 or 39° is warmish bath water or shower water or something of that sort. That gives you some idea. Gas mark 5, I think, is about 180° centigrade, if you want to know about that sort of thing.

Hugely increased ferocity of hurricanes developing over the Gulf of Mexico is the result of a very small increase in the water temperature, and certainly the southern part of the United States and some of the islands in that part of the world have suffered very much as a result. Was that the effect of climate change and global warming? At this stage it would be difficult to be very precise and say absolutely "yes" but nonetheless these are the sort of effects that we would be looking for and that are predicted as the result of increases in the world's average temperature. What increase in the average temperature? you say - we've had the Beast from the East. Poor old Bruce nearly got stuck up in Northumbria with the Beast from the East and had to come home early from part of his sabbatical. It really was perishingly cold.

So what's that got to do with climate change? On the basis of a warming world it's not so much that the temperature goes up everywhere evenly by 1 or 2 degrees, it's rather that as the average temperature of the world increases, as the amount of energy increases, then unexpected and turbulent effects start to take place, and that currents that normally bring the gulf stream up to Scotland, for example, or which cool various parts of the world quite nicely, are suddenly disrupted and we have jets of weather coming across in unexpected directions and all sorts of upheaval and change. People talk about trying, by various means I will talk about in a moment, to restrict the rise in the Earth's average temperature to 2° centigrade and it will take some work to do that, but don't think that that has a comfortable future in store for us!

A 2° rise in temperature would probably result in a 2.7 metre level rise in mean sea level. That's probably way up towards the ceiling here - that's quite a lot and it certainly means probably the elimination of the Pacific Islands. It means the loss of vast areas of coastal low-lying land, and you might think in terms of Bangladesh of which an enormous amount is at very low level. Now just bear in mind all this time that we talk about climate change due to rising average temperatures, rising mean temperatures. It will still get very cold from time to time when currents and winds take new directions.

In recent times we've experienced quite dramatic flooding, recently in Cumbria, also about ten years ago in Shropshire when we had very, very severe localised flooding as a result of rainfall that was so heavy - fluvial flooding - that's where the rain just simply cannot escape and you get rivers where there have been none. It washed away the Severn Valley Railway in about nine different places. It cost £5 million to put right. It did well for the local economy thereafter! There could also be flooding as a result of the sea level rising. Those of you who are older than me will remember the terrible flooding in Essex after the Second World War, where a very very high tide combined with a lot of rain water flooded an enormous amount of that part of the world, and killed an enormous number of people. We've got the Thames barrier of course in that part of the world. The Thames barrier has been operating at an ever-increasing frequency to stop those sorts of events taking place. A new Thames barrier will be required quite soon.

As there is more energy in the system, a small increase in temperature provides an enormous amount more energy and these weather events become more extreme - you will see this. We've had the very very hot weather recently in south of France and a number of people died in that too sadly, and that hot weather is very often accompanied by droughts, a long dry weather, and then you get fires, damage to property as in California this year. Mr Trump blamed this this on democratic politics! I'm not quite sure how that one worked, but he was convinced so it must be so!

There are also unfortunate feedback effects very often when these things happen. As bits of the tundra melt in Canada, for example, methane that has been locked up inside of peaty soil and has been frozen for thousands and millions of years is suddenly released; and you get a boost to the potential warming effect if that happens. But it might be that you say you can put up with all of this - we can put in place preventive and protective measures, particularly in a country like this that sees a fairly equable sort of climate. We can cope with this and we don't need London after all, so we'll just forget about that.

But there is another problem. People will not dependably stay put and drown in their place, nor will they starve or die of thirst where they are. They have the temerity to move, millions of them; and part, only part, please don't misunderstand, but part I believe of what we see in the flood of people coming from sub-Saharan Africa and from parts of the Middle East, part of the reason for their migration, their desire to go somewhere else, is that their homelands are increasingly inhospitable. The other part of the equation of course is very often severe misgovernment and all sorts of other terrible human things; but the fact that their climate is becoming increasingly inhospitable is a factor in Syria that has been the case.

Now is all this true? and I know that some of you think "no it's not", and I understand that there are a number of reasons why people might think differently to me, and I have to politely respect the differences of opinion. But if you were a US Republican it definitely would not be true. If you were a US Democratic it probably would be true. What we see in the United States is a very desperate division along tribal lines of opinions about something which is really quite important, and what we actually need is for those two tribes to talk to each other, but they don't - because of course if you're a certain sort of Republican everything that you know comes from Fox News, but if you're a Democrat you never watch Fox News. There is a great divide between them. This is not helpful. But there is a consensus amongst climate scientists (in other words scientists whose speciality is the climate, the weather, the way that these systems work) - there is a climate scientists' consensus whereby 97% of all climate scientists are completely agreed that man-made climate change due to rising levels of carbon dioxide and methane in our atmosphere is happening, and is a real threat to our continuing way of life. Of the science community at large (and I know some of you come from a genuine sort of science background - we have an eminent biochemist sitting at the back and we have an amateur biochemist standing at the front) - most scientists are behind the climate scientists, but not in that overwhelming sense, so there's something like an overwhelming majority of people in the scientific community, but 97% of those whose speciality is climate science.

We don't have the time or the capacity here tonight to weigh the various arguments but I just ask you to note this consensus, which has grown over time - the basis for the Intergovernmental Panel on Climate Change, the United Nations body, and also for our own government's Committee for Climate Change that seeks to set policy in this country to allow us to deal with some of the threats that we face, and also to make our contribution as a nation to the global effort. It was the basis for the attempt to get governments to support the Kyoto Protocol famously scuppered some years ago by the United States, and later the much more successful Paris Agreement hoping to limit warming to about 1½°C (or 2° at most) under President Obama. Of course, the United States supported this and was one of the prime movers.

Donald Trump has of course promised to pull out of the Paris Agreement, the only country I think other than Syria not to be part of this. Who is advising and why are his views so popular with his own voters? Complex issues to deal with, and involving fake news ironically! But from a Christian point of view I've already mentioned that we should show polite respect to each other's views and also I believe we should politely challenge things that appear to be untrue - and that goes for you challenging us clergy as well as anyone else. Please remember that. Always feel free to challenge me. Christianity as a religion values truth and ways of getting at the truth, and sometimes where we don't necessarily have expertise in the area we have to weigh the evidence. Is this source, is this person trustworthy? Are there reasons for them to think the way that they do? Have they got hidden motives?

It's not for nothing that at the beginning of a school governors' meeting we declare any matters of interest where we have a personal interest in what's going on. (When I look at the agenda of some governors' meetings in some schools I'm inclined to tell the chairman I have no interest whatsoever! That's not quite what they want to hear.) Now in the United States it's interesting that 16 out of every 100 citizens know or understand what I told you that 97% of all climate scientists are agreed about the threat of climate change.

There's been a lot of work that's been subtly done on the American population by various think tanks - Freedomworks for America, Americans for Prosperity: that's two of them - funded by the Koch brothers, who are major coal owners on a massive scale. There are other fuel and industrial interests funding the Heritage Foundation, the Cato Institute and the American Enterprise Institute; and all of these have done a subtle and very careful job not necessarily to deny that such a thing as climate change might be taking place - that might be too obvious - but certainly to help people into the thought that we don't know, that scientists are very divided. Exactly the same happened some years ago: the same group of people indeed in some cases did the same job for the tobacco industry.

The subtle spread of misinformation and disinformation is especially effective in the United States because of the fractured nature of the political tribes. We probably need in our own country to make sure that we continue to talk to people who disagree with us politically at all costs. Our pubs a great places where that sometimes happens.

Climate change as a result of increasing global average temperature is a threat and a concern, and from a purely pragmatic point of view, were I a completely non-Christian person, just from a pragmatic point of view there is a strong case to say that our security is at stake. Our security with regard to food - it will be more difficult to grow and produce food. It will be more difficult for us to maintain our public infrastructure and the buildings that shelter us as the climate gets more violent, and there will be problems of health. We've already seen huge problems of health, particularly for older people with very very hot weather in the South of France. It was a lot of the older people sadly who lost their lives two years ago in that sort of incident;

But of course there are all sorts of new diseases and some of the things that used to be the exclusive field of hot climate disease specialists are starting to rear their heads in our country as well and should be causes of concern. Just a pragmatic outlook should make us concerned about those things but from a Christian point of view we're also concerned for justice, and we can see already that poor people will be hit hardest by climate change. Both in places like Bangladesh and here, here in various parts of our own country, if your compassion is not aroused then again be pragmatic. People who are on the move because their homeland and their life has been destroyed will represent an enormous threat to your way of life and to all those things that you hold dear.

From a Christian point of view of course the Bible is massively directive about our stewardship and our custodianship of the Creation and also for our care for the poor. The Old Testament bangs on inconveniently about our care for the widow, the orphan and the alien (which means the migrant). The Old Testament prophets rage against those who ignore these, and Jesus himself combined two bits of Old Testament wisdom when he said that we were to love God with all we are and with all we have, with our mind and body, strength, everything; and to love on neighbour as ourself. Who is our neighbour? somebody asked Jesus. Whoever you come across in this world, even if our neighbour is on the other side of the world. perhaps. This should be bread and butter stuff for Christian people and we can also do something about it.

We've made quite a lot of strides in the UK which some other countries have yet to catch up with. Over 25% of our energy at various points over the summer has come from renewable sources, another 20% from nuclear power, only a tiny fraction now from coal-fired power stations - most of our local ones have been switched off. The one at Ironbridge, the only one in the diocese, ceased about two years ago. We've also made much of our energy use more efficient, and we don't need so much power despite the fact that our economy has grown.

For daily and industrial life we've managed to be more efficient about the way we burn fuel. The UK's reduced its carbon footprint but there's much further to go. We've cut waste. We could do better in that; we could do better in insulating our buildings. Better buildings. You might say: well, better buildings cost more; but spending once and then saving seems to me a much better idea than having cheap buildings which then cost an arm and a leg to heat, particularly if we put poorer people into the cheap buildings and then expect them to pay to keep themselves warm. Fuel poverty is pretty often a matter of public policy. We may decide that we want to do things to help people to avoid fuel poverty. Sometimes it's said that you cannot do anything to tackle climate change or global warming in case you increase the cost of fuel, and that disproportionately disbenefits poor people. Well, there has to be another way around that particular problem.

Some of this comes back down to politics. We are enormously privileged in this country. You can talk to your MP without fear of being lynched. You can write, you can cajole. Just writing to them worries our MPs much more beautifully so in fact than you might imagine. Most people don't ever bother to write. If you write and ask questions it makes them think. Talk to other people, check facts, challenge folk who spout nonsense. Challenge me if I seem to be spouting nonsense. Seek truth.

Yarpole congregation asked me to talk a little bit about the Eco Church movement of which they're part. I'm just going to read a small part of an email which Rose, their PCC secretary, sent me this morning: "Yarpole St Leonard's has just been given a Silver Award by A Rocha."

A Rocha, an organisation, means 'The Rock' in Portuguese. It’s a network of Christian environmental organisations; and out of the three levels of the award for parishes – bronze, silver and gold - Yarpole has got a silver award.

The purpose of A Rocha is for churches who want to demonstrate that the gospel is Good News for God's Earth. God gave us a wonderful planet. We should not repay him by destroying it through greed and ignorance. A holistic approach covering what you do in the church and in the community, with various online resources to help you to improve your teaching and the lifestyles of your congregation, and St Leonard's have been working on this formally with A Rocha over the last year - but in reality over the last ten years or so these have been areas of concern. So, it’s a great tribute that St Leonard’s has been given this award.

*Mrs Barbara Nurse, Yarpole, added that they hoped to go for a Gold award next year. The address ended here and the meeting proceeded to questions and discussion. The following questions and points arose.*

**The Paris Agreement - what was agreed and what progress has been made?** It was an agreement to drive down carbon use. Even China is now cutting back. Only Syria, Venezuela and the USA are not now committed. It doesn’t help that the USA has withdrawn. There is a lot of info on the website of the Intergovernmental Panel on Climate Change [www.ipcc.ch](http://www.ipcc.ch) and, for the UK, the website of the Committee on Climate Change [www.theccc.org.uk](http://www.theccc.org.uk) .

**Should countries involved in the industrial revolution have more responsibility for the situation?** Yes, we should certainly help (and there are business opportunities in this) but note that not all countries have to go through all stages of that revolution. For example Africa has very successfully gone straight to mobile phones; similarly they are bypassing our 1950s style generation methods and are going straight to environmentally renewable methods.

**What has been done about deforestation in South America?** It’s difficult as the forest is mainly in Brazil/the Amazon basin. But we should do nothing to promote the sale of timber from that part of the world – or soy beans grown on deforested land. We need the local government on board.

**How can we get an urgent sense of being all together to combat climate change?** We need the wartime spirit.

**How do we cope with methane from farming?** For animals it's related to diet. Grass feed is better than manufactured fodder. Humans may need to cut back a bit on meat. An Italian-style diet would be good.

**Does the church do enough in 'speaking truth to power'?** No, the church has been too consumed by other matters - Westminster too. It’s important enough for us to set aside our other concerns in order to address climate change properly.

**Do the Church Commissioners have a policy to prevent installation of solar panel farms?** Probably not. They have disinvested from some fossil-fuel investments. The have kept some other such investments on the theory that they can influence policy by being ‘in the room’. We should make use of solar panels on our churches’ south facing roofs. It’s difficult but Ledbury and Gloucester Cathedral have done it. Ground source heat pumps

**The sun – it’s the principal source of energy for this planet; it pours down more energy in a year on the USA than they use in a year!** We could do a lot more to capture the sun's energy efficiently through solar panels. The sun also drives the wind for wind power, and causes rain for hydro-elwctricity. Currently some 16% of our electricity on average comes from solar farms.

**Climate change driving migration: we seem to close the door and hope migrants will go somewhere else. Is there any sign of a shift in policy?** Little is said about this. However, there are various schemes which help people to thrive and prosper where they are. Solar electricity could be moved more easily from hot countries if it could be in DC rather than AC form.

It was agreed in conclusion that Synod should revisit this very important topic at some time in the future.

JVT October 2018