Climate Change – A Christian's Perspective

Strength in Truth Conference 2023 – Mr Malcolm Lee

Good afternoon everybody and thank you to 'Strength in Truth' for inviting me to speak this afternoon. This will be my third presentation on 'Climate Change' to a Christian audience. I have done two to Christian Values in Education: the first one was 11 years ago so it was a topical subject then and it is very much a topical subject now, indeed an emotive subject. So the last thing I'm going to do, is to tell you what you think about climate change, so I've not come here to do that at all, you are intelligent people, you form your own views, what I will put forward to you is some facts as I believe them to be and know them to be, and also some Christian principles that again I believe should govern the way in which we think about these things. So facts and principles are what you will hopefully receive from me today. It's very important on a subject like this which is so emotive, that you know who I am, where I'm coming from and what my world view is, if you like, because that inevitably colours the way in which I see these things.

So by way of introduction, I am a geophysics graduate, and on leaving university went to work at the Met Office, as you've just heard, for 42 years; I retired 2 years ago. So a 42-year career in the Met Office, when I spent most of my time working with observational data, observations of the weather, and doing what they call analytics around weather observations. So that is my background from a professional point of view. I also am someone who believes the Bible to be true from Genesis to Revelation. Consequently, I believe in an earth that is approximately 6000 years old and that the time is coming when the earth will be consumed with fire and time will come to an end. So those are the perspectives from which I come to this subject.

There's I think a view out there, that you can't be a good Christian and a good scientist, I can see where both sides are coming from, the scientists believe that Christians have such a clouded view of what the world is about, its age and so on, that they cannot possibly have clear scientific views. Everything is too streamlined and tramlined for a Christian to operate in this free-thinking way, that scientists do, which of course, I would refute. And similarly there is perhaps a Christian way of thinking that if you are a scientist and a Christian you are in some way being manipulated into believing things and having to take on board things like evolution and the 'big bang' and these sorts of things, and that is not the case at all. My feeling is, that in order to be a good scientist you need to be a Christian, to be quite honest, because many many other scientists out there who aren't Christians, as we are all aware, are putting terrific energy into totally wrong lines of research, and so I believe a good scientist, a truly good scientist ought to be a good Christian too. And of course, there are many out there, and you have only got to look at places like 'Answers in Genesis' and so on, to see there are many good Christian scientists operating. But as in every other field, not just in science, they are a remnant, there are very few of them, and so their voice tends not to get heard, it gets drowned out. Anyway, so that's where I come from.

So I gave my first talk on this subject 11 years ago; some things have changed, some haven't, we have certainly got 11 years more data now to work with than we had then. In terms of looking at climate change we will see that data is very important. What is climate? Climate describes the weather that you expect to receive. So if you are going on holiday to somewhere in the world that you have never been to before, if you want to know what to expect and do your homework, you will have a look at how wet it is this time of year, how sunny it is, how cold it is, how hot it is, and all of those things are describing the climate of the location. So you would pack your clothes according to the climate that you are going to. But of course,

that is not necessarily by any means the kind of weather you are going to get when you arrive there. You could be bitterly disappointed or pleasantly surprised by the weather that you actually receive. So climate is all about what you expect to get and what the extremes might be, of things like sunshine, temperature and rainfall; and of course, all of these things vary on the seasonal cycle.

A question you may get asked, a question you may have asked yourself, is do you believe in climate change? Well, I would say that is not a particularly smart question for someone to ask you or for you to ask someone else, to be quite honest, because our climate is changing all the time. There is ample information, as we will see in a moment, to show that our climate is constantly changing; so in a sense to say, do you believe in climate change, is almost to say, do you believe that the earth isn't flat? It is something that is just happening, not a matter of belief. A much more useful question to ask and consider is, do you believe in climate change that is irreversible? Might the climate be altering in some sort of cyclic way, and that is certainly an area where one is starting to get into a more sensible conversation. So are we living in a time of irreversible climate change, or a time of reversible climate change?

Timescales are something that we have to get our minds round and think clearly about when we are considering climate change. On a seasonal level if one was to look at some information about temperature, a graph shall we say of temperature that went from summer to winter, you would say, the climate is getting colder and is getting colder very quickly. Similarly, if you looked at a graph that showed temperature from winter to summer, you would say wow, temperature is rising and rising a lot. But we know, that that is something which is reversible, as we go through the cycle of the seasons. And so one has to look at the timescales that one is working on, and of course a Christian perspective is to work on timescales of hundreds and at most thousands of years. Whereas we know for most people out there, their timescales are millions of years, and so they are looking at our climate at the moment and the way it is changing, in the context of what's been going on over millions of years, whereas a Christian perspective is to look at the changes we are currently experiencing in the context of hundreds or thousands of years. And the other aspect is, that any change in what we call the climate signal, the underlying climate, is day by day masked by the weather that you get. It's analogous to looking at the water against a harbour wall, and if you're standing there for 3-4 minutes you will see the water going up and down against the harbour wall, as the waves come in from the sea, it would be very very hard for you to form a judgment as to whether the tide is coming in or whether the tide is going out, because the waves coming in are masking what is a much more long period signal of the tide, whose timescale is much longer than of waves. But if you stood there looking at the harbour wall for half an hour or an hour, you would gradually see if the tide is coming in or going out, and it's very very similar with climate change, but obviously on much longer timescales. The more data you gather over time, the more you can detect what the underlying signals are doing, the climate change signals or not which are actually coming through in the observed data. So that is one way to think about the data that is captured and how one has to gather a lot of data to form any conclusions.

Graphs can be used to present the data that has been captured now over many years. A graph of global annual average temperature back to 1850, clearly shows a warming trend And when you look at climate graphs you will see all sorts of different definitions for the temperature, but generally speaking most scientists will use these pre-industrial level temperatures as their benchmarkFrom 1850 to 1925, really the average annual temperature was just moving around, just like the waves on the sea, going in and out, up and down, but no signal is happening beyond that. But then as we get to around 1930 we can see that there seems to be some sort of jump upwards by about 0.2 of a degree, but no real trend just a jump upwards, and then we come to 1975-1980 when a real warming trend starting to set in. Now

that is a matter of fact, that is data collected from world meterological organization, approved observing sites, all around the world. the y have largely kept to a roughly consistent number, although some come and go with each year. This is a very consistent data set that a lot of time is spent making sure that it is consistent from year to year, because it is so important if one is to get trustworthy information out of it. So we have this signal here, which we can see on all the ripples and variations, that the temperature of the earth is rising, and has risen by about 1.2 to 1.3 C in the last hundred years or so. So that is just one measure of our environment, that is literally just air temperature, 1.4 metres above the ground on ordinary thermometers. Now in support of that there are many things that we can look at which support the consequences of rising temperatures, and they are consequences which we can all hopefully appreciate. Take Artic sea ice – if the temperature is rising, one would expect ice to generally melt, and this is what we observe. So from about 1970 onwards the extent of artic sea ice in September has gradually fallen away.Another indicator of rising temperatures is snow cover in the northern hemisphere. Now that is not quite so strong signal, but it has started to show a downward trend of less snow in the last 30 or 40 years. Again there has been quite a strong falling away in the mass of water in the ice of glaciers, and I expect you've all seen these photos, especially if you go skiing in the Alps, where a glacier is now finishing 3 miles further up the valley and so on. A final example is sea level rise – something which we hear quite a lot about, and that has been measured for a long time., There is a lot of variability in the data over time, but definitely a trend towards rising sea level, only in millimeters, 150 or so over the record. So we're looking at 15-20 cm rising sea level, so it's not much but if your house is right there on the beach it's something you would start to notice especially when the storms come along. So that's temperature data and supporting data, that shows we are living in a warming world.

A little bit more science now, I'm afraid, inevitably there's bits in there but I hopefully won't make it too difficult but it really is quite important to understand these concepts and "feedback" is a very important component of climate change modelling and understanding it, and what are the real drivers that are happening. Feedback comes in two forms – firstly, positive feedback which means that when something happens it starts to accelerate away. For instance, take melting polar ice. Ice is very reflective, it reflects a lot of sun light and therefore heat back into space. As the ice melts, turns into sea water, that isn't so reflective, so the sea water starts to heat up, which in turn starts to melt more ice that is surrounding it, and so on. And so you get this acceleration of the effect, and the melting polar ice is an example of that, of course with a very strong seasonal cycle imposed upon it. Negative feedback is the opposite, it counteracts the change, so basically it tries to bring things back to where they were originally, and for instance, although this is quite a complicated bit of understanding how the climate works, with a warming climate one should get more cloud because the atmosphere should hold more water, so it should get more cloudy, then those clouds reflect more heat from the sun back into space and so therefore have this counteracting effect of the change. Similarly evaporation, the act of evaporating water actually uses heat so that cools down the atmosphere. So you've got these two mechanisms of positive and negative feedback and for the climate change scientists this is a very important area to understand, but our understanding of it isn't perfect by any means at the moment, and so it does have its uncertainties attached to it. Similar to feedback is damping and the best example of damping in the climate systems is the oceans, because it takes ten times as much heat to warm a kilogram of water as it does to warm a kilogram of air. And so the ocean temperature changes much more slowly than air temperature as you know if you ever swim in the sea. You've only got to go to the beach and find that the sea water is still warm at the end of the summer as the air is cooling down and it takes a long time for the sea to warm up in the early summer, it never gets as hot as the air in summer, and never gets as cold as the air in winter. And so the oceans

act as this damping mechanism in a warming climate, or they would do equally in a cooling climate. So the interaction between the atmosphere and the ocean is very important to understand. And just as the oceans get out of step with the air, as you go through the seasons, the ocean takes time to catch up with what the air is doing in terms of its temperature, so the same applies with a generally warming climate, and its thought that one of the reasons why there's been a little bit of a pause in the warming of the climate in the last few years, is because there has been this transfer of heat from the atmosphere into the ocean, if you like the ocean has been catching up with the air in the last few years because of the large changes that were occurring prior to that. So it is a very important to observe and understand what the oceans are doing.

But the main mechanism that helps scientists to understand why we are experiencing a warming of the planet is the greenhouse effect. It's a very simple concept, it can be proved in laboratory, so we are not in evolution space here where there are no experiments to prove it, you can reproduce the greenhouse effect in the laboratory and many gardeners reproduce the greenhouse effect in their greenhouses, that's why it's called the greenhouse effect. And basically what it's all about, is that the radiation that comes from a very hot sun is short wave radiation and that penetrates through the earth's atmosphere very readily to warm the ground below. But the ground on the earth doesn't get up to anything like sun temperatures, and so what the earth radiates out is long wave radiation, and the long wave radiation that the earth produces at the surface gets absorbed and re-radiated by gases in the atmosphere. Therefore some of the heat that leaves the earth actually gets as it were reflected back to the earth again. And it's exactly the same what keeps a greenhouse warm, the glass in a greenhouse is similar to some of the gases in the earth's atmosphere, and so you get this warming up inside. Of course, if you have two panes of glass in your greenhouse it will be that much more heat retentive than having only one pane of glass. So that's the greenhouse effect, very well understood. And what is also very well understood, because you can prove it in laboratory, is which gases in the atmosphere actually react in this way, allowing short wave radiation through but re-radiating and absorbing the long wave radiation. And the key gas which we all hear about is carbon dioxide. That is quite a weak greenhouse gas but we generate an awful lot of it. It isn't very much of the atmosphere, it's only 0.1% of the atmosphere, but it's not so much as is there that is important, it's how quickly it is increasing or decreasing. So it's a fairly weak greenhouse gas but once it's there it's quite hard to get rid of it; if you just leave it and do nothing, it has a residence time of about 100 years in the atmosphere. And that's why you hear people saying,"Well, even if we do something now, things will still get worse." What they're drawing on there is this residence time of carbon dioxide in the atmosphere. Another greenhouse gas that you hear a little bit about is methane, which you get from the decay of vegetation, and this gives another positive feedback mechanism, because as the permafrost in Siberia starts to melt, the vegetation frozen into the permafrost actually then starts to decay and to release methane into the atmosphere, so that is one area where the melting of the permafrost is actually creating methane. It's a very strong greenhouse gas but comparatively there's very very little of it available to affect climate change and it's got a residence time of only 10 years, so you could soon get it out of the system with the will to do it. The final main greenhouse gas is water vapour, which of course originates primarily from the oceans. Of course water vapour is the gas you can't see; clouds are condensed water vapour which you can see. Water vapour fluctuates daily because the amount of water vapour the atmosphere can hold is a function of its temperature, so as it gets hotter the air can hold more water vapour, another bit of positive feedback. In addition, humidity also varies from day to day depending on whether the air has been in contact with the oceans or dry ground. These, as it were, day-to-day wave fluctuations are very much greater than the tide for water vapour changes due to global warming. So those are the three main greenhouse gases, the cocktail of gases that are

acting as a blanket, either thickening or thinning out all the time in the atmosphere. Measurements of atmospheric carbon dioxide back to 1959 show that it is steadily increasing. And so it's not surprising if carbon dioxide is doing that then the temperature is going up as well in roughly some sort of tandem way, even though it's only 0.04% of the air. One has to bear in mind that although it is not very much, the actual amounts are very small, when one is looking at changes in air temperature we work in degrees Celsius, but when you look at these sort of things you have to use the absolute temperature scale which goes down to -273C, and so when we look at a 1 degree change in air temperature, it's 1 degree in 300 degrees, not 1 degree in 20 degrees or 10 degrees. The temperature changes being observed are not very much but they are about as 10 times as big as the changes there in carbon dioxide.

Industrial emissions: coal, gas, power stations, transport and rainforest destruction, these are all pouring out increasing levels of carbon dioxide, and so at least a large proportion of the increase in carbon dioxide that we're experiencing is due to these sources as they pump it out into the atmosphere. But there are natural sources of variability in temperature, it isn't all carbon dioxide generated at all. One of these is, El Nino, which you may have heard something about. Normally you have trade winds running from South America towards Australia, and these trade winds drag the water along with them and cause cold water to well up from deep down in the ocean along the western South American coast. And that cold water inhibits evaporation and rain forming. Now if those trade winds decrease, or even if they start blowing in the other direction, that cuts off the cold water coming up from below along the South American coast, and so the sea surface heats up much more than average, along the South American coast giving an El Nino situation, which generates much more evaporation and clouds and rain and so on in that particular part of the world. But it upsets the whole balance of the atmosphere in the world, in a way that meteorologists are only just starting to understand. It's quite a fascinating subject to get into if you're someone like me (but obviously not for other people!). El Nino, and the alternative is La Nina, where the trade winds are blowing extra strongly and bringing even more cold water up to the surface, alternate irregularly and this has been monitored for the last 70-80 years. Now why is that important? Well, it impacts on the whole global weather situation and basically El Nino situation adds somewhere between 0.1 and 0.3 (depending on how strong it is), degrees C to the warming in the following year from which it occurred. Now we are currently moving into quite a strong El Nino situation in 2023, so the expectation is in 2024 if nothing else happens at all, 2024 will actually be 0.1 to 0.3 degrees warmer than it would have been without El Nino, so it is pointing ahead to 2024, globally being a warm year. And this happens roughly every 2 – 7 years. So we've got this cycle of El Nino and La Nina on about a 2-7 year cycle that we need to take into account when we are looking at the data on global warming.

Another factor is the sun: the sun's output varies on an 11 year cycle, and throughout that cycle it translates into about 0.15 degree C variation in the earth's temperature, as the actual power coming out of the sun varies by 0.1% on its 11 year cycle. And there are almost certainly other cycles there in the sun too. It is believed that a very quiet period between 1650 and 1715 was probably one of the main contributing causes to what was known as a little 'Ice Age', when there was these frost fairs on the frozen Thames in London and so on. Temperatures were depressed by about a whole degree. So there are things which go on in the sun which we don't fully understand and probably haven't observed yet, in terms of its output, but obviously we've got a good handle on what it is producing at the moment and where it is in its known cycle.

Another driver of global temperatures are volcanoes. Volcanoes spew out gas and aerosol into the atmosphere, and of course if it's a very powerful volcano, it will pour out loads of gas and aerosol, and it will take time for the atmosphere to process and absorb that and so what

you can get is something called ‘global dimming’. Apart from the gases a volcano pumps out, it pumps out particulates of dust, which actually acts like a pair of sunglasses on the earth, and causes this global dimming. So even the short wave radiation can’t get through to heat up the surface, so it cools the planet. The Mount Pinatubo in the Philippines erupted in 1991 it made 1992 made a cold year. Krakatoa, which went up in 1883, was probably the most intense eruption that has occurred in the last 200 years. It caused 4 years of depressed temperatures after it, the climate was very much cooled in the late 1880’s, and there was quite a lot of consequences around the world, in terms of agriculture and so on.

So, that’s some of the different inputs that actually make the climate warmer or colder, operating on all sorts of different timescales. So, where does all this lead? If we are warming up, what is the weather that we are experiencing that is unusual? Well, Pakistan in June-October 2022 had its worst floods ever recorded, I think something like a third of the country was under flood water at the height, this was due to a very strong monsoon season, so driven by the weather. Spain and France had wild fires like they had never seen before in July 2022, and Spain in April this year (2023) broke its temperature records, the highest recorded in April than ever before this year. And last year you will be aware that UK broke its maximum temperature record, not by a little bit but by 1.6C to get over 40.3C and the whole summer last year was the joint hottest along with 2018 on our records, and these records go back to about 1660 something; so the temperature records in the UK go back a long way. Stephenson Screens are used the Met Office and all the world meterological organisation countries, to record their temperatures using to get consistency. So if the climate wasn’t changing we would very rarely break temperature records, and then only break them by tiny amounts. Whereas we have broken our temperature record for the highest temperature, I think it’s 3 times since 2000, and the really fascinating thing about the last one, was it was by 1.6C, that was a really big change. And so we see these extremes happening. Yes we get hurricanes and typhoons and so on every year, and yes we can’t say how climate change is effecting them, but when we see records being broken, and its usually temperature or rainfall, those are the two areas indicative of a warming environment. A graph showing summer temperatures in Europe shows a trend that has been very strong since about 1980 with 2022 being the most extreme so far with 2021 and 2018 not far behind. You’ve only got to look at the weather we’ve got at the moment and is being experienced around Europe to see that this year doesn’t look like being a lot different from last year.

So, we see the impact on UK weather of climate change. And this is where we look to computer modelling to tell us what is going on and to have all these equations and feedback mechanisms, all loaded into super computers, and what the computer models tell us is that we are heading towards warmer summers punctuated by thunderstorms, and that is for the most part what we have been seeing. And mild, wet, stormy winters. We haven’t seen much in the way of stormy winters in recent years, but we have certainly seen mild, wet ones. Now it doesn’t mean to say that every year is going to be like that, it’s just a trend in that direction, and at the moment the weather we’re getting is supportive of what the computer models are indicating we should expect. The UK is a very small country covering 0.05% of the globe, so just because we are having a very warm summer doesn’t mean to say global temperatures are going to be very high, if we are having a very cold summer, it doesn’t mean to say the temperatures around the globe are going to be very low. There’s lots of spatial variability in what goes on in any one year, and you can’t judge in global terms by what is going on in the UK; we’re only a small part of the globe but equally we do obviously see these trends occurring.

So, moving forward, what are we going to do about it then? So, there is sustainability, how we live with it – a term you hear a lot about. Mitigation – that’s all about reducing global

warming, getting the carbon dioxide out the atmosphere, or very least don't put so much into the atmosphere. It's clearly the primary mitigation that we hear about and why we're going to be driving electric cars in 2030. So mitigation is a big thing. Adaptation is another aspect of what is being looked at, and that's basically 'live with it', It comes down to such actions as: if you live close to sea level in a sea level rise area, move away from the coast and go and live somewhere higher up the hill, that's a very crude example. Which one – mitigation or adaptation? Well inevitably there is a mixture of the two being worked at.

Now moving on to how people think about climate change. We have considered a little bit of background about climate change itself and what is going on, if you like, the facts. Now let's come back down to the feelings regarding of climate change and what is going on. What I am going to describe now is three different groups of people. To start off with, the 'old earth worriers'. So what do they think about climate change? They think the earth's environment is very delicate and if we don't do something then we are going to totally ruin our environment as it were, make the earth impossible to live in. They believe in millions of years into the future, so they are worried about what the earth is going to look like in a million years time if all these changes are happening now. Now I would say personally, we don't have to worry about what the earth will be like in a million years time, given that it was only created 6000 years ago. They say, we must preserve our natural resources, we've got to keep all those natural resources that we're using, (this again comes down to those millions of years), we've got to make sure that we've still got those resources in a million years time to actually exploit, so we've got to preserve our resources and use them in a very frugal way. Change has never happen this fast before – you often hear this, well sorry, but to those of us that have a Christian perspective, then what was going on in and around the flood and immediately after the flood was climate change like we have no experience of here at all, and the human race has survived all through the 'Ice Age' that occurred a few hundred years after the flood and losing of the tropical environment before the flood. Almost certainly the earth tilted on its axis during the flood, we have seasons now, whereas we didn't have seasons before the flood, although we can't be sure about these things. Similarly, rain is something that probably didn't occur before the flood; there were the mists that watered the earth. It was a very much more tropical environment before the flood, so quite a lot warmer, hence the dinosaurs got on very well before the flood, and then immediately after the flood we went into this very cold period, from which we are still recovering. So climate change has happened much faster before. And then there's this decadent, unsustainable Western lifestyle that we are living, that is only unsustainable to the people that believe the earth is going to be around in a million years time.

Then we've got the 'climate change deniers' – where do they come from? What's going on in their heads? We've seen it all before, it's natural variability, they say. Well, there's a lot of natural variability in our climate but the way in which we are putting carbon dioxide into the atmosphere is such that whatever the natural variability might be there's going to be an underlying rise in temperature. It's very straightforward science. They go on to say that global warming has peaked. Well, maybe there are negative feedback mechanisms operating that we don't know anything about at the moment, and that's what we would have to look to in order to say that global warming has peaked. They also speak of questionable science and manipulated data. Well, as I said, the science is very straightforward, it can be replicated in a laboratory, and from my own personal experience working at the Met Office, I know there's a lot of integrity that goes into getting these data right from around the world and so the data is not manipulated. There will still be errors and so on, but they're not manipulated.

It's green agenda hype is another mantra of the deniers. A certain type of person has 'just shouted very loudly' and consequently everybody is following them, and there's some conspiracy to force upon us unnecessary lifestyle change, so we're all being forced out of our

petrol cars into electric cars, or whatever, not because of climate change, but there's some other agenda going on that we are not aware of. That's the sort of argument one hears from climate change deniers.

Then I come onto the third group, and I think this is the one which Christians should be most careful about, I'm not pointing the finger at anybody, I'm absolutely not doing that, I'm just saying from my perspective (pointing the finger at me, if anybody), this next one is the one that we need to be most thoughtful and careful about. And that's having an agnostic or complacent attitude: 'I don't care', to put it bluntly, I don't care whether it's climate change or not, I don't mind, I'm not interested. God will make sure that nothing nasty happens. Well, I think human history is littered with events where the Almighty has let humans go their own way and do their own thing, it's all under His permissive will, but one has only got to look at the wars through the ages to see that nasty things have happened under God's permissive will, caused by the sin of mankind.

The flood promise prevents climate change. Well no, because 'summer and winter, seedtime and harvest, cold and heat' will continue, we have those seasons because of the tilt of the earth on its axis, not because of anything you might say is associated with climate change. So until the earth doesn't have a tilted axis, then the promises after the flood will hold good.

The earth can cope. So rather than this very fragile earth that the million year worriers have, then the complacent and agnostics perhaps swing more on the side: the earth can cope, it will all get mopped up and wrapped up and sorted out in the end. So it won't affect me if it does happen. Well, it might not do, but is that a right attitude to have? But it certainly may do, and it certainly is already affecting other people. And so there is a tendency, if one is not very careful, to be wilfully ignorant about what are actually matters of fact.

And I think we have got to be very careful about this last point of – I want to carry on pleasing myself. So if we have got antipathy to some of these things that are being suggested we should do because of climate change – why is it? What is it in me that is raising that antipathy? Is it because really I want to carry on pleasing myself? And obviously we can only answer that as individuals.

Considering a slightly different take on it – there's two contrary positions. One is interventionism and the other is fatalism. The Bible teaches us about the narrow way that leads to life and the broad way that leads to destruction. And we can see examples of that in so many facets of our life, be that spiritual or providential. And here we see it in this way – there's a middle way and it's a narrow way, because we have got the interventionist in the climate change context who are all playing up the evidence, keeping on making it sound worse and worse. Then you have got the fatalist who plays down the evidence. Well, what should the Christian do? I believe the right thing for a Christian to do is to weigh up the evidence, think it through, have an open mind, don't jump to conclusions. The interventionist says the earth needs help, we've got to do something to help the earth. The fatalist says, the earth looks after itself. The Bible says, we've just read it in Psalm 8, man has been given custodianship of the earth, the creation has been given to man to manage and look after. The interventionist thinks about the next million years, the fatalist they just live for today, and a Christian will know about creation and final destruction. The earth is getting old, the earth is coming to an end, we haven't got to worry about a million years time, but equally it is not right to just live for today, we do need to think about the future for our children and so on. But we know not how long that future will be. Interventionists are very zealous, fatalists are very careless, and surely the Christian way is to be caring. The interventionist believes they are very educated, they know all about it, the fatalists are quite happy to be in the dark, and surely the Christian way is to sensibly understand these things. Interventionists say it's easy, just get

on and do it, like mitigation and so on. The fatalists say it's all too hard, just give up. And perhaps the right way is we should do what we can. Prevent and ban is the interventionist mantra, be profligate and keep going is the fatalist mantra, and again we have perhaps some sort of sensible restraint is what the Christian should be thinking about. The interventionist say there is only one way and that's my way (that's Greta Thurnberg way), the fatalist say well there's no way, there isn't any way, but surely for us it should be, what is God's way?

I think to sum these things up, there's a statement made by a group of African Christian clergymen at a conference, and I think this is a very very powerful statement that sums up where we should be, that was written about 15 years ago, but I believe that is stil a true statement. 'The earth has enough resources to satisfy everyone's need, but not enough resources for anyone's greed'.

So, coming to a close, what should Christians do? These are my feelings, so coming from my perspective, I share them with you but clearly you have to form your own. Gratefully and sensibly using natural resources which God has provided for us, being an example to others - not to be profligate in how we use the various resources but wisely, thinking in terms of what could cause further warming of our climate To heed advice about reducing pollution and energy use, to love our neighbours – think about what we are talking here about how the changing climate around the world impacts others perhaps more than ourselves. Remember the poor (it's always the poor that suffer most), and follow your conscience, having acquired a level of understanding that you feel is right for you. Don't forget the earth is getting old, it will be rolled up like a scroll, and there's plenty of evidence that that could be sooner rather than later, so we shouldn't be agonizing and stressing and worrying about how the earth is going to cope in a million years time, it might not be here tomorrow. Now I don't say that in a flippant way but that's the truth of the matter. And don't worry, 'pray and not faint' is what we are encouraged to do as Christians, and this is no different example to any other as to how we should conduct ourselves.

So leaving all that to one side now, I thought I would just mention a few terms and conventions and so on – the climate change jargon:

The inter-Governmental panel on climate change: this was set up in the 1980's, Margaret Thatcher was very much involved with it, and it's basically where all the scientistic research is brought together and Governments are advised based on the scientific research, so it's a matter of pulling the scientific research through to what mitigations and adaptations Government might do based on the scientific research.

UN Framework Convention on climate change: set up in 1994 which most countries signed up to, I don't think the United States did, they have been in/out all the time depending on which President has been in. So there's the UN Framework Convention on climate change 1994 and from that there's

the annual conference of the parties: COP26 was in Glasgow a couple of years ago, it was in Shamal-Sheikh last year, and I think it's in Malaysia this year, so every year there's this conference of parties. This is much less a scientific gathering, much more a 'how can the countries of the world come together to work together in this area?' And of course it's a very difficult area to work in because you as an individual can't do anything at all really, even as a country we are very small, and so there's always this difficulty in our heads: well what can I personally do? What should I personally do? Or even for a country, many countries in the world, what can we do? You know, think of poor Pakistan with all the floods last year, they contribute 1% of the carbon to the atmosphere, and yet pick up a really heavy impact from that. So this is a very difficult area because it is a global issue and this is what we have at the

moment which is operating to address this issue. After the Tower of Babel with the spreading apart of the nations of the earth, we shouldn't be surprised if there is a lot of difficulty in coming together to do this, and it might not be the Lord's will that it should happen, and if the earth has got its finite span, then is it even necessary?

Paris Agreement of 2015 which you may hear referred to and that's where the 1.5 or 2C rise in temperature above these pre-industrial levels was set. Again using models and the impacts, above 2C is where really serious impacts are likely to occur in things like storms, flooding, drought, crop failures and so on, which are all very real outcomes, and the idea of trying to keep it to 1.5C because if we can keep it below 1.5C, again all the modelling that is taking place indicates that we can probably adapt to live with that without any consequences that are too harmful.

Carbon capture: that is all about sucking carbon out of the atmosphere or preventing it from going into the atmosphere in the first place, like scrubbing carbon dioxide out of the flues of coal power stations and so on.

Carbon offset and trading: this is all about where someone somewhere agrees to plant a tree to take carbon out of the atmosphere whilst someone over there does something to put carbon into the atmosphere, and you trade between yourselves, it's sort of like a currency, a carbon currency, all designed to bring levels of carbon in the atmosphere down.

Net zero, carbon neutral: it could be personal, national scale or international scale, net zero is all about, you don't put any more carbon into the atmosphere than you take measures to pull it out, you go carbon neutral and net zero. But of course, net zero, carbon neutral, all they will do is keep carbon levels at whatever level they are when you go to net zero around the globe, it doesn't actually bring them down. And finally,

climate models: what the Met Office and many other organisations run on super computers, it's like running a forecast forwards for hundreds of years instead of doing a weather forecast for tomorrow, you're effectively doing a forecast for a hundred years ahead. And it's fundamentally as simple as that, requiring really really big super computers to consider, what if/what next? Because in the computer models you can put in a lot of carbon, you can take a lot of carbon out, you can alter the feedback mechanisms and so on, and they all produce the different scenarios which then other industries use for planning how they're going to mitigate our worse or best case scenarios and so on.

Oh there's just one more thing. The climate emergency that we are all in. Well, I'm not going to comment at all about that, you decide. Are we in a climate emergency or aren't we? Hopefully I've given you a little bit of background now to help form your own views as to that.