

What is the Anthropocene Epoch?

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[0 : 00] O God, our Father, we thank you for this day, and we thank you for the opportunity to think about your world. We ask for clarity of expression, we ask for humility of expression, and we ask for your guidance as we talk together.

In your name, Amen. So we are actually in good company this morning. The Royal Society of London has just completed a session on the topic of the Anthropocene Epoch, and what I think we should try to do.

I mean, we're in this fourth part of the quadrilateral, which has to do with the Church in the world, and it seems important that we communicate some of the things that are going on in the world, in this case in the academic world, and in the world of the Royal Society of London, which is one of those places that has a high reputation in the world of science and elsewhere.

And the issue, quite simply, boils down to the matter of whether the world around us is indeed reflecting the image of the triune God, or whether it is really more apparently the glory of man, which is replacing the glory of God's image in his created order.

That was not the question that the Royal Society of London posed, that the implications of the Royal Society of London's discussion was, are we now in a sufficiently different world that we have to define a new geological era, so influenced by human activity as to require a new epoch in the geological column.

[2 : 24] So what I should like to do is to give a short primer on epochs, talk a little bit about what the implications, what the details, some of the details of what the Anthropocene epoch might be, and more importantly, what the implications for us as responsible Christians in a world where the image of God in his creation is rapidly being overshadowed by the works of man in his arrogance.

So let me just start by directing us to some quotes. As the biblical background to what I want to say, the intrinsic value of the earth as created by God seems to me to be summed up extremely well in this quote from Psalm 24, verse 1, and repeated specifically in 1 Corinthians chapter 10, verse 20. The earth is the Lord's and the fullness thereof. It's one of the key themes, especially in the Old Testament.

In Exodus, we hear Moses explaining to Pharaoh that the miracles which are being brought on the Egyptians are in order that the Egyptians might know that the earth is the Lord's.

Nehemiah acknowledged that God has made the earth and all that is in it. The heavens declare the glory of God, says the psalmist in Psalm 19.

[4 : 27] And Isaiah declares that the whole earth is filled with his glory. It is precisely because of this that Paul tells us in Romans chapter 1, verse 20, that we are without excuse if we deny God in the face of such overwhelming evidence around us.

But that was then, first century A.D. And here we are in the 21st century in the midst of what I hear call a huge debate.

It may not have actually impinged on all of us here. Nevertheless, to many of us it is a huge debate as to whether or not we are to define our times as the Anthropocene epoch.

The meaning of which, in everyday words, is an age in which the hand of man is everywhere dominant. Are we, or will our children be, without excuse, in an age wherein the glory of man fills the whole earth?

I believe that there is a profoundly new reality. And it's also my belief, note my belief, I'm not trying to make a party political broadcast here, it is my belief, that as Christians we have simply not taken this matter seriously enough.

[5 : 59] Are we living in a world which is so different from all that has gone before that we have to define a new geological epoch? And we'll see that's really the summary of the biblical references.

And then I shall say a few words about what are geological epochs.

And I shall spare you the listing of the whole range of geological epochs. I just want to introduce you briefly to the most recent four, starting with the Miocene, which runs from 15 million years ago to 5 million years ago, followed by the Pliocene, which is estimated to run from 5 to 2.5 million years ago, followed by the Pleistocene, running from 2.5 million years ago to 10,000 years ago, and the fourth epoch in which we now reside, the Holocene the Holocene epoch lasted from 10,000 years before the present until now.

You'll notice that the Anthropocene is not on this list because it has not yet been formally approved as being sufficiently recognizable as a distinct geological epoch.

My view on this, just to clear the air, is that although it has not been declared, it seems to me inevitable that it will be declared sooner or later in view of the trends, which I'm going to try to show on some overheads in a few minutes.

[8 : 09] The fact is that you will find references to the Anthropocene epoch in Wikipedia, but you will not find it in geological textbooks. It has not yet achieved the status of such an epoch.

Some of the matters which some of you feel more comfortable with, the suffix seen, comes from the Greek word for recent, and by geological standards all these epochs and several more are recent, even going back to 15 million years ago.

Reading from the most recent to the oldest of these epochs, the Holocene means entirely new. That is to say, it's based on the newness of the vertebrates that are found in the fossil record.

The Pleistocene means mostly new. The Pleistocene means more new than the Miocene. And the Miocene means fewer new vertebrates than the Pleistocene.

Don't worry. Don't worry. It's not important. The epochs are characterized by relatively constant climatic conditions.

[9 : 34] and that's the way in which they're divided up and they're characterized by relatively consistent fossil remains. So that between 23 and 5 million years ago it was much warmer than now and the concentrations of carbon dioxide in the atmosphere were as high as 650 million parts per million by volume.

But they also gradually came down to about 100 million parts per million and as the climate of the Miocene became progressively cooler.

In the Miocene such things as the appearance of the Antarctic ice sheet occurred. And was initiated slightly before the start of the Miocene as things got gradually colder during this Miocene epoch so the Antarctic ice sheet got larger.

During the Pliocene epoch cooler and drier climate prevailed and glaciers started to appear in Alaska and in northwestern British Columbia.

During the Pleistocene epoch commonly referred to as the ice age about 20 or so advances and retreats of ice sheets over North America and Eurasia occurred over the course of the last 2.5 million years.

[11 : 10] And during the Holocene epoch the last 10,000 years ice sheets have been reduced to Antarctica and Greenland and the climate has remained relatively constant until recent times.

And of course there is a huge debate about climate change which I don't specifically wish to address here although happy to discuss it afterwards. The point simply is that this is a convenient way of summing up different time periods in the geological column and it is a shorthand way of referring to the different climatic conditions and the different kinds of fossil forms that were found during these time periods.

Now what about this Anthropocene epoch? It means as indicated a time period during which the hand of man is everywhere dominant literally recent with humans dominant translation again are we living in a world which is so different from all that has gone before that we have to define a new geological epoch called the Anthropocene epoch.

The evidence such as it is for the changes I'll come back to that slide can be summed up in a number of different ways geographers can only think in terms of maps so I have to bore you with a few maps just to make the case this is a map showing the river basins of the world that have been dammed dammed in the last few decades all the coloured areas are in fact controlled by dams and that represents a sense of the scale of human dominance in the way in which the river flows of the world are controlled and summed up in reservoirs and interfered with if you like by people let me make the point which is important there are both positive and negative things to be said about the interference of people in the affairs of nature it's clear that many parts of the world would be even

more short of water for irrigation than they are at the moment as a result of the presence of reservoirs and dams so there's some very positive things to be said it's also true that the implications and the effects of damming are not understood well as we know from the situation of the Nile where disease has been a problem and in particular from my special interest's point of view the coastline of Egypt especially along

Alexandria is now being extremely rapidly eroded because of course the sediment that is held back in the reservoir is now no longer coming out into the Mediterranean Sea so that this whole system of the Nile is actually catching the sediment before it gets to the ocean my only point is that each of these examples that we quote has both positive and negative aspects and the only case that we are concerned to think about is how much does this glorify man as compared with the extent to which we recognize the hand of God in his creation and I would also say that one of the problems with much of the discussion that you see in the contemporary world has to do with polarization between those who say that everything that we do is wrong as compared with those who believe that everything that you possibly do to engineer the world is good.

[15:41] So there's a polarization here which we should not, it seems to me, get wrong. We need to be able to assess in a balanced way what are the positive and negative but the overall issue is to what extent are we able to still see the image of God in his creation.

Those of us who fly off to the Antarctic and so on are quite impressed by God's work but most people don't necessarily get to see some of the more magnificent examples of his work.

A second illustration just to make a point is a map of the changes in nitrogen flow to the oceans.

Nitrogen of course allows huge productivity of agricultural products.

The application of nitrogen has transformed for example North America in terms of its ability to produce ten times as much per acre as had previously been envisaged.

good thing. But all these dark green colors you see around the United Kingdom terrible people coming out of North America terrible people.

[17:06] The Amazon Southeast Asia China dreadful people all pouring nitrogen out into the ocean and losing what are called dead zones.

It was long recognized before the oil spills in the Gulf of Mexico that the Gulf was dying and the records of asphyxiation of divers associated with the drilling of oil in the Gulf of Mexico long before the oil spill associated with the recent disaster essentially was created by the loss of oxygen anaerobic conditions which essentially destroy the animal life the vegetation and so on at the bottom of the Gulf of Mexico.

Well it's not just the Gulf of Mexico you see it is a global condition that the use of nitrogen which is so valuable in terms of increasing productivity on the land has negative impact in the result of what happens to the oceans.

And this of course is also a function of the last few decades and lies behind this discussion about whether or not we are really in a new epoch because this kind of thing was not present prior to this last few decades.

We have simply intensified so much the control and the use of our land. One could go on endlessly but fortunately for you we won't.

[18:57] But here is a map showing the percentage of coastlines in the world which are densely developed. very high proportion of the world's population is located close to the coastline and this is just an illustration of the way in which these coasts and particularly associated with some of these tropical islands where the rates of change, the rates of growth of settlements in the coastal area has intensified over the last few decades.

And I can... this is also a map of the coral reefs at risk in various parts of the topics.

These light blue colors are where things are quite healthy and the darker red is where things are somewhat tense in terms of the survival of the coral reefs.

Now, in order to just illustrate what this means, over the course of the last 400 years, we have a couple of maps, one showing the changing distribution of cropland.

You can see in 1700, hardly visible, 1800, well, we get to 1900, things are starting to look quite busy, and then by 1990, the extent of cropland is enormously increased.

[20:45] On the right-hand side, we have both cropland and pasture. The increase in pasture land also has been dramatic. On this picture, we go from 4 million square kilometers of croplands to 18 million square kilometers of cropland in the 1990s.

With respect to pasture, we have a similar rate of increase from this very small amount to very large amount.

higher than bear in mind, there are positives and negatives in all this, but it's the question of what this does to our children's and our grandchildren's perception of God's creation.

And how if one extrapolates, and I suppose one shouldn't in this audience extrapolate, but nevertheless, if one does, we'll just see that the hand of God has become progressively less obvious.

And I think that's the message that I'd like to emphasize. the final map, we'll be pleased to know, is something called the human footprint on the planet.

[22 : 14] The human footprint is made up of rather complex numbers, some of which are measured, some of which are estimated, but it demonstrates the extent to which the human footprint has now transformed the land surface.

Associated with that, you have the loss, the permanent loss of 15% of the soils, you have a modification of 50 to 60% of the soil resource itself, and the extent to which this represents a modification over the course of the last 300 or 400 years is a matter of consumption.

considerable interest and concern. So I present these evidences to make the case for the recognition of an Anthropocene epoch, and although it has not been formally approved by the senior geologists of world, it seems to me to be very likely that in the next decade or two this particular epoch will be formally recognized as the most recent epoch.

There are all sorts of problems with that, which I don't need to trouble you with in detail, but of course the first problem that you might recognize immediately is when did the Anthropocene start? Some make the case that it goes back to 5,000 years before the present, when the beginning of the transformation of the Mediterranean and lands associated with it occurred, and indeed there is evidence from the Greenland and the Antarctic ice sheets, deep down in the ice, of a change that occurred in the composition of the atmosphere around 5,000 years before the present.

[24 : 20] But most people are inclined to look at the 1700s, maybe as late as 1800s, as the real turning point when the hand of man became progressively more dominant.

And now, within the last few decades, that particular effect has of course accelerated. And that's really the key point to be made here.

I'll go back to my notes. May I just give one big caveat to this talk?

Nothing that I have to offer in any way disturbs our conservative understanding of the history of salvation. It is the weakness of our conservative understanding of creation history which may be at issue.

As I have stated here, on a number of previous occasions, the conservative understanding of the history of salvation is biblically foundational and experientially profoundly true.

[25 : 45] But we have as a community put much less effort into getting to grips with creation history. There are some very good reasons why we have not got to grips with creation history because it has been so dominated by non-Christian thinking.

That simply asks the question why that field has been left to the non-Christians to cultivate. if it is true that we are in a new epoch, the biggest positive feature of that has to do with the fact that more people are able to live in an economically comfortable lifestyle.

but the biggest argument against this or the biggest argument about the concern for this is that the glory of man is replacing the image of God in his creation.

This is not a matter of saying no to progress. It's a matter of reminding ourselves of the stewardship of the land to which we have been called. Not all human-initiated change is negative.

There are ways in which the creation has been marred and where that human intervention brings that creation back to a condition which more closely matches its original. A local example which comes to mind is the rehabilitation of mining sites.

[27 : 44] Not only the sand and gravel pits surrounding Alder Grove and Abbotsford but also the copper mining clean-up projects at Britannia Beach on Howe Sound. But the converse to that, to those examples which are remarkably effective, is the case of the Alberta oil sands.

Physical devastation that has already been caused at that site is unique in quantity and spatial extent. The area that has so far been marred is now so extensive that it can be seen very clearly on satellite images taken from distant parts of space.

A large part of oil sands management involves clearing trees and brush and removing the overburdened topsoil, muskeg, sand, clay and gravel. As of now, in excess of 500 square kilometers of overburden have been removed and only 65 square kilometers have been reclaimed.

oil sands operations use the equivalent twice the amount of water used by the whole city of Calgary. Most of this water ends up in tailings ponds, which now cover close to 100 square kilometers of land, the actual tailings ponds themselves.

[29 : 02] Monitoring of these waters is not well done, partly because of the lack of information of the full range of pollutants associated with these surface mining operations. It's almost impossible to find a good and reliable person in the midst of this controversy.

David Schindler is the University of Alberta's most respected limnologist. He has for a number of years been concerned about the impact of this extensive landscape disturbance, particularly on the lake ecology.

He has proposed a royal commission to investigate the effects of this massive landscape disturbance on the indigenous people, the ecology, and the sustainability of the resource extraction. It's not a matter of putting a stop to the exploitation of the Alberta oil sands, but it is a matter of ensuring that God's creation is protected from unnecessary defacement, and that the needs of different groups in society are also fairly considered.

if we take the Bible seriously with respect to its claims that the earth is the Lord's and the fullness thereof, and that one of the ways in which natural man can perceive God's handiwork is in his creation, then we should surely be more active in seeking ways of remedying man-made scars in the landscape, and resist more strongly those forces that would destroy God's creation without providing any guarantee of remediation.

[30 : 44] This is not a new problem. There was a man called Engels, who was a good friend of Karl Marx, who said in 1844 that the productivity of the land can be infinitely increased by the application of capital, labor, and science.

In 2010, a book came through my door from my insurance agent, written by a man called Ridley, which said that prosperity spreads, technology progresses, poverty declines, the environment improves, and wilderness expands.

This was written in 2010. So, apparently, Mr. Engels has had a greater impact than David Suzuki. But what we need to note is that most of our systems are built on the back of soils.

Remediating degraded soils takes hundreds of years. Reconstructing soils takes thousands of years. land use change that have been prominent during the last four centuries can be summarized in the following way.

Deforestation for pasture and agricultural expansion, and the cropland has increased from 3 million square kilometers to 18 million in that time.

[32 : 32] Dam impoundments and irrigation agriculture have increased by an order of magnitude. Grazing land has increased from 5 to 31 million square kilometers.

You're probably wondering what's left of the earth. Well, there's 130 million square kilometers of land on the earth's surface. And I haven't even mentioned the implications of urbanization and suburbanization, where 3% of the earth's land surface is now occupied by built-up or impervious areas.

3% of 130 million is 4 million square kilometers, which is built-up or impervious area. And urbanization also affects land in rural areas through the more distant ecological footprint.

If I could just quote one particular example of what happens in the case of urbanization, probably the extreme example, is that a case of Hong Kong.

In the year 1997, the total non-food material resources consumed were 25 times more than the total material turnover of the natural system.

[33 : 50] fossil fuel energy consumed exceeded photosynthetically fixed solar energy by 17 times. So the scale of modification that we are faced with in the urban context is order of magnitude greater than what is happening in the, quote, natural world.

climate change with increasing aridity and the variability of runoff in temperate and tropical zones, the net effect is to increase the vulnerability of the Earth's created systems.

The take-home message is that we need to be vigilant, recognize the complexity of decision-making in a society which is making increasing demands on its God-given resources.

One simple criterion we can readily apply is to ask to what extent the claim that the Earth is the Lord's and the fullness thereof is being compromised by the arrogance of man.

That is my presentation. I'd be happy to have questions.

[35 : 19] Yes? What can you tell us about the organization in Kader Rasha? I'm just reading that book, Planet Lines, that was written by the fellow who started that. It's the most positive activity in the Christian community locally.

And extremely interesting work going on there and it's constantly being brought to our attention. It doesn't seem to gain a huge amount of general support, but what they're doing is absolutely first-class.

does it seem to have the ability to expand or to influence? Well, it's still at the writing stage and the public lecture stage.

It's not really influencing decision-making, as far as I'm aware, in government or other places. but it needs more support in terms of finance in order to become more aggressive.

And that, of course, raises the question of how aggressive should one be in this context. Yes? Do you think now, because we're not like you have the agricultural era, do you think that there was more respect for the land and probably the city as well in that era than now?

[36 : 50] Because the more removed we get from the land, you know, where individuals don't really bother growing their own vegetables too much and things like that, do you think that's making it a lot worse?

We were watching a geographic video of the Antarctic with the emperor penguins recently, and there were scientists going back and forth and they were studying you know, they put the device on the penguins back and then it went in the ocean discovering what they eat apart from krill and it was really eating a lot of fish, small fish, and it was great, but finally when they went, you got news in California and LA that there had been a huge melt because you were watching the melting of the ice there, and the poor penguins were stranded in these crevices and they couldn't get them out, and it was just awful at the end, and they go off so far, didn't they?

But it's really melting. Well, what you're pointing to is an example of a problem, it seems to me, that the media have taken this issue in a direction which is sometimes highly emotional, and the methods are of all degrees of rigor.

I think that some of these are clearly the leading-edge understandings of what is happening. It's a question of why we have been left a little bit behind the starting line on some of these issues.

And I know part of it is because we don't wish to be identified with long-haired radical aunts, but there must surely be a way in which we can express more intelligent concern.

[38 : 52] Yes. Shin, Robert, and Jason. Shin? You mentioned the negative effects of oil sands, and also potential negative effects of dams.

So these are used for power, for energy, and also there was a recent study that said even wind-powered generators can change their climate locally, and then of course nuclear power is, just all power plants, nuclear power plants in Japan got shut down.

So is the only good solution to just use less power? Because every source of power is bad. Well, I think your question is very important, Shin, and I think that the radical perspective on energy is to say, shut down all coal fire furnaces and all oil, and somehow or use candle power.

It's obviously an absurd position, with all respect, in order to move towards a more balanced view of energy, one has to talk in terms of a gradual transition towards alternative methods.

It seems to me that one of the problems is not so much that oil is bad, as to the great reliance upon oil as a single energy source makes one vulnerable.

[40 : 41] So I don't think that the use of less power is the answer, but there needs to be a transition, but here I'm talking about something that Phil knows much more about than I.

It seems to me that we're so caught up with polarized positions on these things, and a sensible approach seems to be a more gradual transition towards alternative sources of energy.

solution. Does that get a good point? Sure, but I'm wondering if there are no good alternative solutions. Well, I think that solar power would surely in the long run be a likely solution.

technology is available. We can't say at this point because the technology is not available for large scale.

power is going to be a good alternative system. I think you said that you weren't suggesting that we didn't keep progressing in terms of technology.

[42 : 07] technology. And it was reported this morning on the radio that the power was shut down in parts of Tokyo due to tornadoes and hail storms. But it wasn't reported that all of the nuclear power plants had been shut down due to protests.

People obviously feel, with summer coming and the necessity in Japan for air conditioning and so on, they feel that we want it shut down. It's not worth it.

Well, that's an immediate response to the drastic events of last year.

And one can see the same kind of response when the Three Mile Island explosion occurred.

Immediately, it was going to be banned and then graduates come back.

But it seems to me that that is one of the options. And France continues to enjoy that particular power source very dormantly.

[43 : 17] Did you? Well, to start off, I think it's inevitable that we will attempt with all our efforts to replace the glory of God, the glory of men.

Well, that is the reason why Adam ate the fruit. That is the reason why the daughters of men married the sons of God that triggered the flood. That is why we built the Tower of Babel.

So that's inevitable. That's what we work towards. It doesn't matter what we do. But at the same time, you can challenge me on this.

I don't know how far I'm stretching it. Technology and human progress, human intellect, is also a blessing of God. So if you look at Vancouver, look at urbanization, look at using an energy source, does that not also the use human intellect, a way to glorify what the Lord gave us?

Well, I couldn't agree more. I think that indeed we need to be grateful for that. And that is after all, that is part of God's creation.

[44 : 45] I'm simply asking whether children and grandchildren will be able to see God's image in the same sense as was the case in the past.

Does Paul's argument fail in this new era? What he called Christ to say. It's not an era. Errors are much longer. So, yes, Sheila.

I'm always before, hasn't it? Not today. Okay, Sheila. I agree with what Jason was saying about, you know, human creativity and so on being part of the wealth of this planet that God gave us.

He also gave us that. But I want to go back to what you said about gradual change. I don't think we have control over that. And it would be really nice if we could get some huge think tank of people like yourselves and others saying, now, if we do this in China, it's going to do this to the Amazon. And if this happens in Antarctica, then Vancouver is going to need something else. But it doesn't happen that way. The same book that said the earth is the Lord's also said go forth and multiply.

[46 : 09] And look what's happened to us. We did. And now we have to feed those people. And now we have to house them. And now we have to use whatever we have where we're living.

Now, I know political boundaries shift around and so on, but not necessarily a whole lot. In other words, Canada's got oil and wood and coal and things like this and we have to use this.

And somebody else has a coral reef and they have to use that. So I don't know how you put all that together in a gradual way that makes good scientific and survival sort of sense.

Everybody seems to be working on a much more ad hoc plan and how can we get around that?

Well, that's a big one.

I suppose my concern is that there are very few places like Arosha where this kind of thing is being discussed by Christians. And I thoroughly agree with you that we should conduct more discussion and inform ourselves more fundamentally about what is going on.

[47 : 24] I don't... There's no lack, by the way, of advice on how we're going to transition. And there are many books available on transition. But it's not going to be gradual, is it?

It's going to be... It has to be gradual. There doesn't seem to be any... There doesn't seem to be any other idea. Well, relatively gradual.

We've got other people. Phil? According to your diagram, Australia isn't producing any dead zones. That's right. Except for the Murray-Murray-Bidgee Delta.

Is it because they're good or because they're lazy? They're just Aussies, I guess. The Old Testament prophets describe the earth as wearing out like an old garment.

And God, in the end, will roll it up like a carpet. So, not that that helps too much, but your report on the tar sands certainly is really promising.

[48 : 35] And... But I doubt that politics will ever step aside. No, but I think it seems to me that we have the obligation to comment.

Because there's an ethical issue here. Seems to me. And the difficulty is to make the comment in a way that is hard-hitting, but not loaded with political baggage.

And that's the sort of terribly difficult line to draw. Yes? I appreciated the reference to the Tower of Babel.

It also comes to my mind. And the other thing that came to my mind was the cycle of repetition that we see in the Book of Judges.

Falling away, coming back, falling away. this is leading into a comment on the two points of origin that you proposed 5,000 years ago, more or less, and 1700s.

[49 : 45] where in that space of time did we go wrong, and what could we have done about it?

If you take it back to 5,000 years ago, you mentioned the institution of agriculture. agriculture, but that is also the point at which we acquired writing.

And, you know, that's the technology, and that may be the technology that underlies everything else. So, I personally think it's going to come to a Book of Judges catastrophe.

I don't see, you know, I don't see how the gradualism that you propose can work. Well, that's a fair comment. There's a very interesting author called Watswoff Smil, S-M-I-L, who has written a margin of the books on the issue of how the transition can probably take place.

But it does involve passage of decades and what's achieved. So, you know, Phil, and then Phil next.

[51 : 09] Some thinkers say the root of our problem is population growth. I suppose since 1700, what factor has the population increased by now?

Oh, 30 times. 30 times. There you are. And so, some are advocating that drastic means should be taken to potato population.

And what's the Christian position on that? other than asking about the packet.

We think we know that there are another 2 billion people to be added before the population levels off. population. There are 2 billion people and 99% of them in the developing world.

population council has determined that contraception and birth control is the answer to development problems.

[52 : 20] the Roman Catholic Church has expressed strong opposition to that. So, in effect, nothing of a global scale is possible.

They're allowing it in some cases. The Catholic Church. Uh-huh. The Pope's consent. This would be on a regional basis? I'm not sure because it's just at the very beginning, which was really surprising, but then there is, you know, he does have a criteria.

Mm-hmm. Well, it seems to me, Paul, that a Christian position is to recognize that there is a likelihood of increased population over the next, well, probably up to about 2050.

And that in this period, this is what I'm really referring to as a transition period, that one has to accommodate them, the needs of this extra 2 billion people, by continuing to use somewhat dirty energy sources, but transitioning to cleaner energy sources over that time period.

Does that sound... This is kind of extreme, but writers like Paul Ehrlich would recommend that strong legal, economic legislative sanctions should be placed against the growth of families.

[53 : 51] Mm-hmm. And, you know, you could say, you could justify that on preserving the planet. But shouldn't Christians have something to say about that?

Well, indeed, but I'm not quite sure in which forum we would say it. Mm-hmm. I mean, the advantage of the Roman Catholic Church is that it has an organ for stating what the Roman Catholic position is.

Now, I know there's a lot of conflict within that, but nonetheless, we don't seem to have an equivalent way of expressing... No, I mean, I hope you noticed that I did not try to create here a political position.

Yeah. Yeah. I think we've all got to think about it and sort out prayerfully what is our Christian responsibility. Yeah. So some will come to different conclusions.

And certainly the coercion that you're speaking about is something that we would surely want to avoid at all costs. Mm-hmm. So, yes, Loretta? I was just thinking, when I worked for International Nickel, at that point back in the 70s, they were polluting Sudbury to the point of no vegetation.

[55 : 06] Mm-hmm. And it wasn't until either, I don't know whether it was laws or what, but something came down that said you have to do something about this. And then they built something on the top of the stacks that would modify the emissions.

Yeah. And so I have this feeling that we don't have to pollute to the extent we do. We can, industry can curtail that quite a bit, but because it costs money, they don't want to do that. And it's always that kind of thing. We don't want to spend our profit too bad. We'll pollute that river or whatever. And to me, that's key right there, to think that somebody can, yes, you can make profit, but to think that they won't even spend a bit of it and use the technology. But you see, your example is a good one. Sudbury is a success story. And there are many success stories. And I think the problem with our media is that they exaggerate the polarization that's going on.

Mm-hmm. And of course, there are companies that will not spend a penny on remediation. But gradually over time, there has been improvement in the behavior of individual companies and so on.

[56 : 15] So I don't think the answer is to curse industry. Mm-hmm. They're all nasty people. It doesn't really help. No. That is, to point to examples where success has been achieved and a more respectful relationship between the industry and God's environment.

Mm-hmm. God's creation is possible. So it seems to me that that's the direction in which I would go in this and encourage as much discussion and most of this as possible on the complexity. It's a really complex issue. It's not an either-or thing, which I think is a problem in some of our discussions. Yes, please. Yeah. Like, for example, you were just discussing here that like in the Third World and parts of the world where I know they say in India that the children are their heritage.

You know, they don't have flashiness and that most of the population. So that's their heritage. But if you can't afford to feed those children, you know, in parts of the world, in Africa, they can't afford to feed those children.

So, you know, birth control education is a good thing. We've populated the earth to that extent where, you know, you no longer need to keep doing that.

[57 : 30] You need to have more control. But if the people aren't aware of birth control, they don't have it available, then it's a non-issue. But the thing is, that's one way of, you know, if you can't feed them, then it's really, is it right to keep having them?

And I can't understand how they keep having them if it's so unhealthy themselves. Well, I was recently in Ethiopia, and of course you can see some of the most extraordinary examples of overpopulation in extremely harsh circumstances.

And the reason they keep having them is simply that they lose so many, and the chances, therefore, are greater if you have more children that one or two will survive.

And in Ethiopia at this point, you're looking at a typical family with six children, which means that you're going to rapidly exhaust the resources.

Anyway. Can I ask you one? I'm sorry, I was just going to ask you one more thing. Did you hear in the Great Barrier Reef in Australia that the law is built about two years ago by a Chinese vessel?

[58 : 37] And I just thought that they wouldn't be allowed to come, do you know about that, to come close enough to such a... I don't know whether it's been cleaned up by now. I'm just going to...

Chinese tankers, just like Canadian tankers, stray from the funnel. And as Jason says, we also stray from the funnel.

So you can't... You can't... Even with legislation, you might find, you can't guarantee that you're going to be able to keep the pristine coral reef. So... Last question, Ali?

As a bouquet comment, I think you've confirmed that humanity probably needs to be shot. I need to leave you a little bit of time to talk about slightly different something.

Right. Yeah. With Bill's permission, we have an important issue to discuss. Many of you, most of you, I guess, will know that Bill and Betty are stepping down from their extraordinary role in this Learners Exchange.

[60 : 10] And we are blessed by their ministry. It's been quite an extraordinary thing, over 20 more years.

They have led this into the really exciting fellowship that we now have. And so we're grateful to them. They've agreed to hold on to the responsibility until June the 30th.

But on July 1st, we're on our own. So we have to take some decisions. And one of the discussions that has been had by a group of us that met a few weeks ago was that we should actually break up

the tasks that are associated with each of the positions within the Learners Exchange Committee. Now, in the bulletin today, there is an announcement to the effect that I will be receiving nominations for various positions.

But the bulletin does not tell you what positions are available. And so with your permission, I'll try and read out these positions with a description of what is associated with them.

[61 : 32] By the way, the planning committee, which consists of Dr. Packer, E.D. Rittinger, Sheila Westberg, Bill Chandler, and myself, has been converted into a nominating committee so that those five individuals will in fact be receiving this set of nominations.

Though for ease of handling it, it's helpful if you could address any nominations directly to me. And then we will meet to sort out the decisions.

At the moment there are just five, but we are suggesting that there should be eight positions on this committee after learning from Bill and Betty of the wide range of responsibilities that they've been taking.

And we think that it's... Well, in the past, I should say, with all due respect to four of us, we've been somewhat freeloaders whilst Bill and Betty have been doing most of the work.

Not to underestimate the importance of our chairman and the other members of the committee, but just to say that Bill and Betty have carried very large loads and we've tried to then spread these out a little.

[63 : 03] So if I could just read out these positions. First of all, the chair. This person chairs all meetings of the planning committee and oversees the program to ensure that all components of the quadrilateral are represented in each 12-month period.

If you don't know what the quadrilateral is, it is biblical studies, it is Anglican tradition, it is Christian character studies, and it is the Christian in the world.

In case you didn't recognise what today's talk was about, it was the fourth of these sides of the quadrilateral. Also, the chair introduces each speaker.

Now, of course, the chair may occasionally be indisposed, but that's the function of the chair. This we would advertise as a relatively plum job in relation to what comes next.

The vice chair, I'm told it's not appropriate for a Christian organisation to have a vice chair, but that was... This person coordinates the teaching program and prepares a list of intended speakers for the spring and fall sessions.

[64 : 25] The list is approved by the planning committee, and the vice chair invites all speakers personally. The vice chair discusses equipment needs and relays this information to the equipment assistant.

This is a new position. Ensures that titles are received as soon as possible. This is one of the challenges. There are all sorts of good volunteers in this church, but actually extracting a title from them.

Bill can tell you more about that. And then the vice chair reports back to the planning committee on responses received to invitations and receives and files biographical details of each speaker.

So that's the sort of nuts and bolts of that position. The third position is a secretary who takes minutes in each meeting of the planning committee and circulates these to all members of the planning committee.

This person keeps statistics of attendance each Sunday morning, and drafts the year-end report in January and February. The fourth position is a fellowship table coordinator.

[65 : 31] This person establishes and sends out the duty roster for the spring and fall periods, keeps and augments a list of food suppliers, purchases a whole range of items, and actually in this list there's the information that two teapots are stored in a black box together with a dishcloth and tea towel.

Quite clearly this is an onerous position. The fifth position is entitled the clergy liaison person. This is to ensure the two-way flow of information between the clergy and the planning committee.

This person also liaises with the Reverend Eric Thurston, who provides names of the second-year Artizo interns who are expected to give talks here. The dates for the Artizo interns are sacrosanct because they are linked to the preaching schedule of the Church.

The next position, the sixth one I believe, is the Church Office Liaison Person. It ensures the two-way flow of information between the Church Office and the Program Committee.

Joanne McKinnon is the contact person. She receives updated copies of the program for advertising in the Parish Life Notes as well as on the St. John's Vancouver website.
[66 : 53] And this person will, in fact, submit all receipts of expenses incurred to Joanne for reimbursement.

The seventh position is equipment assistant, a person who assists with audiovisual details, the recorder, the overhead projector, ensures that the talk is recorded each Sunday, arranges overhead transparencies for speakers and purchases these when required, there are different practices with respect to transparencies.

You see, some of us have got illegible transparencies but nevertheless don't have to charge the Church for them, whereas others will need to be reimbursed.

And then finally, there's a member at large position which is intended to generate publicity about members' exchange to coordinate feedback and to try to get a larger representation of people under the age of 75.

So those are the positions. Obviously, you may say, well, good gracious me, why are you trying to organise the world here?

[68 : 11] The fact is that so many details became apparent when Bill and Betty set out what they'd been doing but it seemed like it was unlikely that we would get candidates to actually fill the range of functions that they have been carrying out.

So, if I could just say one more thing, the process from here, for the purpose of this nominating process, Olaf, Sleymaker, I will act as Chair of the Nominating Committee and you're asked to submit nominations to them by email.

It's Olaf.Sleymaker at UBC.ca or you may submit suggestions by handwritten note on or before May the 15th. Anyone who has a heart for the Ministry of Loaners Exchange is encouraged to volunteer for one or more of the above positions where they can see an obvious fit for their talents.

You're also encouraged to nominate individuals for other positions if you have their permission to do so. That's in bold. Don't nominate people who have protested that they will not stand.

Final point, please understand that the current Planning Committee, as the five people that I mentioned, have resigned as from July the 1st. However, they are technically eligible for re-nomination.

[69 : 39] It is that the committee's firm and hope that the majority of the new committee would indeed be new. So, if you would pray about this, if you wish to email me before making nominations, by all means do so.

I'm available to respond to my email at any time. Yes? Is there a set of terms for these? Oh, good question. Very good.

Yes, we were reminded about the importance of that. There will be three-year terms and they will be staggered. Nothing to do with shooting people.

Staggered. One will just have a one-year term to get another two-year term and three-year term to get the process moving. But then, thereafter, it will be a three-year term that one is expected to handle.

Yes, Debbie? Is there any possibility of having a chairman who will be ongoing? Who is that? Who will be ongoing.

[70 : 50] Because it's three years for everybody. Ongoing. Ongoing, I see. Well, that's a possibility. That's what people would like. I mean, is that going before the nominating committee?

Would that idea go before the nominating committee? It would be an excellent idea, probably. I certainly have no objection to it. If the majority are going to be new, you know, we should have someone who has knowledge of it.

Yeah. Ongoing. Yeah. Yeah, well, that's a very, very good suggestion. I haven't pulled that one through, but it sounds good. Anyway, I don't want to hold you any longer, but please think carefully about this.

Bec-Week Talk. And thank you for the ■ Keeping the Comniations OK. And thank you, Dylan Beck. Thank you.

Thank you. Thank you. Thank you. Thank you. Thank you. Thank you. Thank you. Thank you. Thank you. Thank you. Thank you. Thank you.

[71 : 57] Thank you.