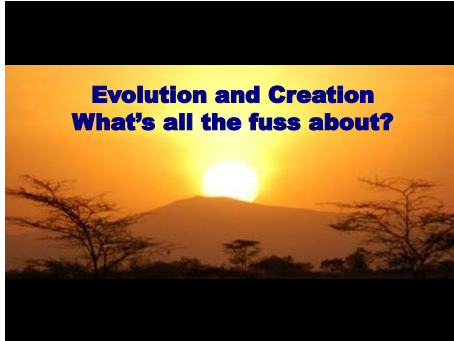


Evolution and Creation: What's all the fuss about?

*CiS Manchester: The Manchester Science and Philosophy Group
Thursday 12th May 2016, St. Peter's House, Manchester*



Evolution and creation.

Now let me be honest.

I never really wanted to talk about evolution and creation.

But here I am, doing just that.

So perhaps I should begin by explaining why I never really wanted to talk about it.

And why I now am.

Firstly, I never really wanted to talk about evolution and creation because, for me, it isn't something to make a fuss about.

EVOLUTION	CREATION
Explanatory theory	
Process of adaptation and change	Act of God

As a scientist, I understand evolution as a very useful, explanatory theory.

It's a theory that doesn't directly affect my research.

If it disappeared tomorrow,
it wouldn't change in the slightest what I do.

But it's a theory that's very important in other areas of science,
and which will only be displaced
if an even more useful, explanatory theory comes along.

Furthermore, as a scientist, I understand evolution as a process.

A process of adaptation and change, occurring over time.

As for creation:

As a Bible-believing Christian, I understand creation as the act of an awesome God.

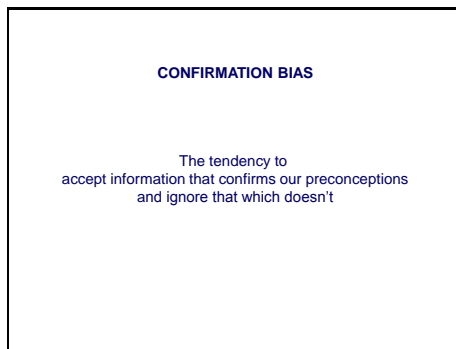
And I understand that any processes which may occur within creation,
are themselves the product of God's imagination.

Creation may involve evolution, or it may not,
that's for scientists to work out,
but to set creation – an act – against evolution – a process,
to me is simply nonsense.
They're fundamentally different.
It seems as daft as to set an apple against the colour red.
An apple may be red, or it may not,
but redness can't be placed in opposition to applesness.

So, for me, to set creation against evolution just doesn't compute.
There are theological and philosophical questions to be addressed,
and I'll come to those later.
But, for me, there's no necessary conflict between evolution and creation.

However, many people do see a conflict.
So much so, that even when I'm talking about something completely different,
and to my mind much more interesting,
it's an issue that keeps getting raised.
So, it seems the time has come, to work through the question:
Evolution and Creation: What's all the fuss about?

A second reason I never really wanted to talk about evolution and creation,
is that it can be an unproductive topic of discussion.
Whether it's an extreme atheist with a pathological distaste for the concept of God,
or a fervent believer, unwavering in their particular interpretation of Scripture,
any attempt at discussion can be over-ridden by the force of opinion.



One problem is what cognitive psychologists call “confirmation bias”:
The tendency we all have to select information that confirms our pre-existing beliefs,
and ignore that which doesn't.
What I'm hoping we can do this evening, is put aside our preconceptions,
and think honestly and objectively through the question:
Evolution and Creation: What's all the fuss about?

A third reason I never really wanted to talk about evolution and creation,
is because it can be a divisive topic.
Perhaps especially so amongst Christians.

My prayer is not for them alone.
I pray also for those who will believe in me
through their message,
**that all of them may be one, Father,
just as you are in me and I am in you.**
May they also be in us
so that the world may believe
that you have sent me.

John 17:20,21

One might think – one might hope – that those who claim to follow Jesus,
would be mindful of his prayer, shortly before he was arrested,
for those who believed in him,

“that all of them may be one” (John 17:21)

Now Christian unity is not to be sought at all cost.

Not at the cost of misrepresenting the nature of Jesus,
or the work of God’s Holy Spirit.

But, throughout history, Christians have found some quite bizarre things to argue about.

Leading, all too often, to needless schism.

I don’t want to add, today, to pointless argument.

But, rather, to seek mutual understanding, as we work through the question:

Evolution and Creation: What’s all the fuss about?

Now, when people make a fuss about anything,

when people get into arguments...

It’s always worth looking under the surface,

for the things they’re not saying.

HIDDEN ASSUMPTIONS

Assumptions people make,
without realising they’re making them

It’s always worth looking for the implicit premises, or hidden assumptions.

The assumptions people make, without realising they’re making them.

One thing I’ve discovered, is that people can argue indefinitely,

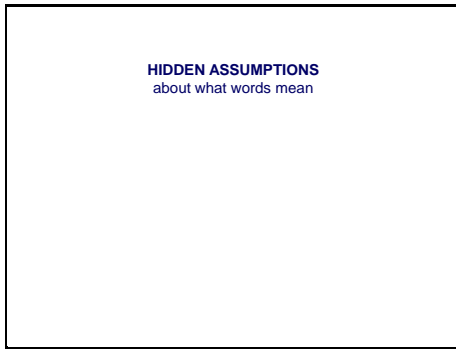
without realising the real conflict is under the surface,

without realising the real conflict is in the hidden assumptions.

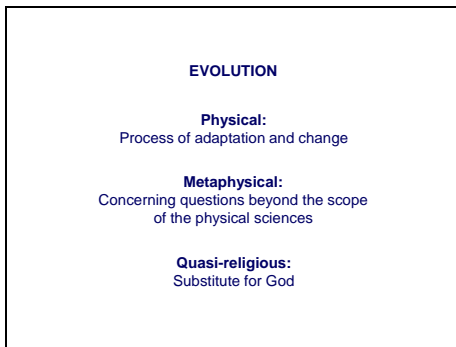
So the approach I want to take this evening, is to consider some of the hidden assumptions,

that seem to me to underly many of the arguments I’ve heard,

in relation to evolution and creation.



To begin with, people may make very different assumptions about what words mean.
Especially, words like “evolution” and “creation”.



If we think about the word “evolution”:
I’ve already indicated that I think about it in scientific contexts as a process.
A process of adaptation and change, occurring over time.
But the word “evolution” may be used in other ways.

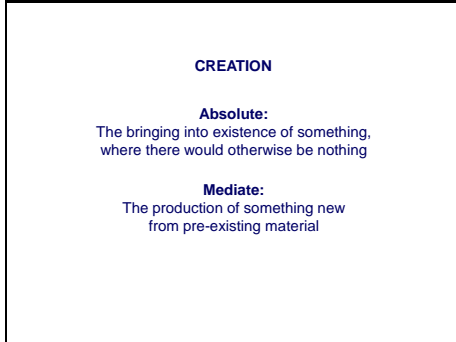
It may be used in a metaphysical sense.
To describe something beyond the physical, rather than to describe a physical process.

It may be used in a quasi-religious sense.
As a kind of God-substitute.
And when people ask the rather odd question
“Do you believe in evolution?”
They’re using the word very differently to how I use it.
Because, for me, belief has nothing to do with it.
I accept evolution as a very useful, explanatory theory.
But if an alternative, more useful, theory came along,
I would be perfectly happy with that.

Some of us will go out of our way to avoid, as far as possible,
any metaphysical or quasi-religious connotations of the word “evolution”.
But others operate with the hidden assumption that the word “evolution”
only has quasi-religious significance.
Indeed, I’ve heard it said that
“Evolution is a religion.”

Now if, when I use a word, I think I'm talking about a physical process, but it's understood by the hearer in a completely different way, it's no wonder we get confused.

And if there can be confusion surrounding the word "evolution", that's equally true of the word "creation".

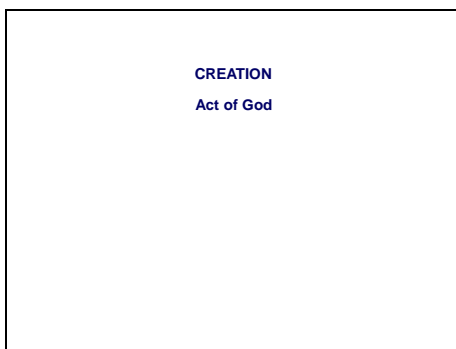


Some people would distinguish between "absolute" or "primary" creation, the bringing into existence of something, where there would otherwise be nothing, and "mediate" creation,

the production of something new from pre-existing material.

In the Biblical account,

man – or at least man's physical being – is a result of "mediate" creation, formed from "the dust of the ground." (*Genesis 2:7*)

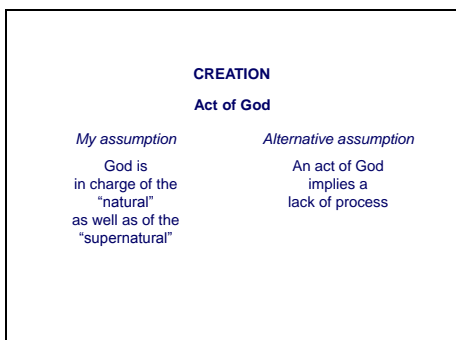


Whether "absolute" or "mediate", I think of creation as an act of God.

By which I mean, all that is only exists, and continues to exist,

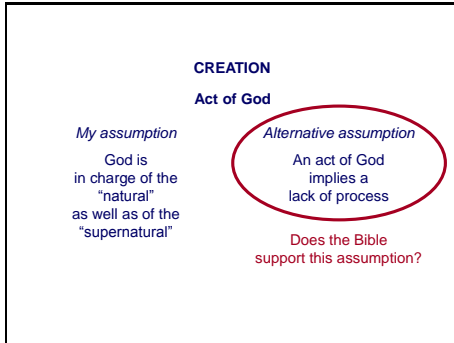
by the active, creative power of God.

And that any processes which may occur within creation, themselves arise from God's imagination.

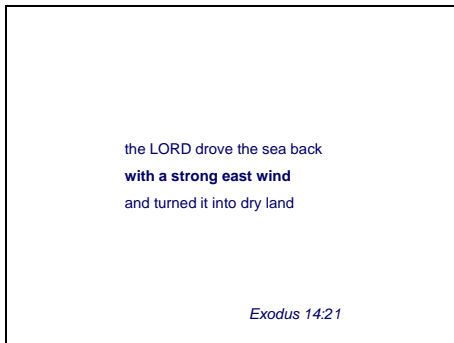


For me, God is as much in charge of the “natural”,
as of anything we might call “supernatural”.

But others operate with the hidden assumption
that an act of God implies a lack of process.
In which case, creation necessarily excludes evolution.



Let’s ask whether the Bible supports that assumption.
Does the Bible give any examples where an act of God
involves a natural process?
It seems to me there are plenty of such examples.



Consider Exodus 14:21, the parting of the Red Sea.

“...the LORD drove the sea back...
and turned it into dry land.”

Clearly presented as an act of God.

But how did He do it?

“...the LORD drove the sea back with a strong east wind...”

A strong east wind.

A physical process.

In him
we have redemption
through his blood,
the forgiveness of sins,
in accordance with the riches
of God's grace

Ephesians 1:7

Consider, too, what in Christian theology is perhaps the greatest act of God.

The act of redemption. (*Ephesians 1:7*)

The act whereby God made it possible for sins to be forgiven,
and for us to be brought into a right relationship with Him.

The Christian understanding is that the act of redemption is very much linked to a process.

A very nasty, messy, agonising process.

A slow, painful death on a cross.

It seems to me the Bible gives plenty of examples,
where God acts through physical processes.

So for me, to say "God created"

doesn't necessarily rule out the possibility of an evolutionary process.

But anyone who assumes that an act of God implies a lack of process,
will inevitably draw very different conclusions to me.

Evolution and creation.

What's all the fuss about?

Some of the fuss arises from differing assumptions about what those words imply.

People use words in different ways, without realising it.

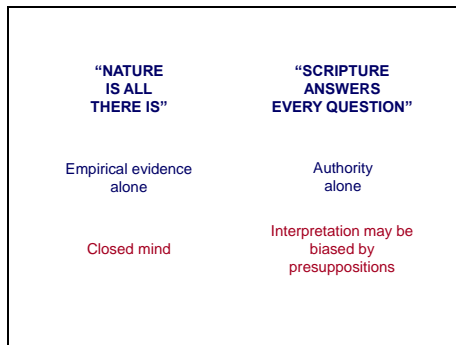
Or, perhaps, without caring.

But what else might the fuss be about?

HIDDEN ASSUMPTIONS
about what sort of questions to ask
and what sort of answers to expect

Some of the fuss arises because of assumptions people make about
what sort of questions to ask,
and what sort of answers to expect.

At one extreme, there are those who assume the only questions worth asking are about physical causes and effects.



For them, nature is all there is. Any talk of “gods” or “souls” or anything that might be deemed “supernatural”, is ruled out of order. This has sometimes been called “naturalism”.

The appeal of this approach to its advocates, is that it seems rational only to accept as fact that which is based on solid, empirical evidence. The problem with this approach is that it closes the mind, to forms of evidence that may not fit a person’s presuppositions, to questions that may have deep significance. That’s how “confirmation bias” operates.

And if at one extreme, there are those who won’t even look for answers to questions about anything beyond the physical... At another extreme, there are those who expect the answer to every possible question, to be provided from the “supernatural”. They look to the writings they perceive as divinely inspired, the Bible, the Quran, or whatever, as the arbiter of truth in every situation.

The appeal of this approach to its advocates, is that it seems rational only to accept as fact that which comes from the very highest authority. The problem with this approach is that it’s all too easy to read into those writings, a person’s own presuppositions. That’s how “confirmation bias” operates.

Let’s focus on the Bible, which I personally accept as divinely inspired and authoritative. And for me, if the Bible is “authoritative”, that implies allowing it to set the questions, rather than us imposing our own questions on it.

Practical
Honest
Illuminating
Loving

Accept him whose faith is weak, without passing judgment on **disputable matters**.

Romans 14:1

Previously at one of these meetings (*15th February 2013*),
in a talk on “When is a day not a day: Genesis 1 and geological time”,
a transcript of which you can download from the group webpages,
I suggested some principles for tackling disputable matters.

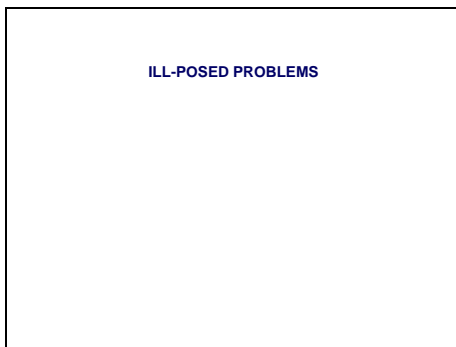
Firstly, I suggested the questions which really matter are **practical** questions.
Questions impacting on our everyday lives and relationships.

Secondly, I advocated being **honest** with the evidence.
Being cautious about speculation that goes beyond the evidence.
Speculation can be fun, even useful,
but beware of allowing speculation to transmute into dogma.

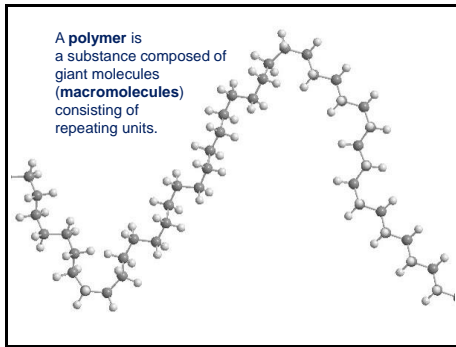
Thirdly, I encouraged that which was **illuminating**.
Shining a light on the underlying causes of an argument.
Exposing hidden assumptions.
Which is precisely what I’m seeking to do today.

Fourthly, I hoped it could all be done in a way that was **loving**.
Recognising that people see things differently.
And that some things are more important than being right.

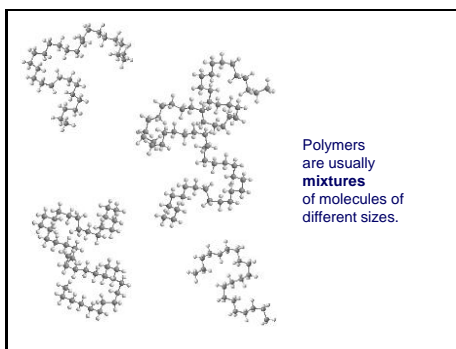
If I could pick up the point about being **honest** with the evidence.



In science, some problems turn out to be, mathematically speaking, “ill-posed”.



In my research, I'm interested in polymers, things composed of giant molecules. And one of the most important questions about a polymer is “just how big are those molecules?”



And because we nearly always have a mixture of molecules of different sizes, we want to know what the mixture is like, the distribution of molecular sizes, or the molecular weight distribution. A long time ago, I used an analytical ultracentrifuge – I called it George – to study polymer molecules.

SEDIMENTATION EQUILIBRIUM

$$c = c_0 \int_0^{\infty} \frac{\lambda M g(M)}{\exp(\lambda M) - 1} \exp(\lambda M \xi) dM$$

If we know the molecular weight distribution, $g(M)$, we can calculate the concentration distribution

If you subject a polymer solution to a high centrifugal field, and allow it to reach what's called “sedimentation equilibrium”, then the concentration distribution is linked to the molecular weight distribution. The equation that links them is a Fredholm integral. If you know the molecular weight distribution, you can calculate exactly what concentration distribution to expect at sedimentation equilibrium. But what you generally want to do, is the reverse of that. To measure a concentration distribution, and hence determine an unknown molecular weight distribution.

SEDIMENTATION EQUILIBRIUM

$$c = c_0 \int_0^{\infty} \frac{\lambda M g(M)}{\exp(\lambda M) - 1} \exp(\lambda M z) dM$$

Calculation of the molecular weight distribution, $g(M)$,
from the concentration distribution is an
ILL-POSED PROBLEM

And that turns out to be an “ill-posed problem.”
It can’t be done reliably,
because the slightest imprecision in your data
– and there’s a degree of imprecision in all data –
leads to erratic results when trying to solve the equation.

SEDIMENTATION EQUILIBRIUM

$$c = c_0 \int_0^{\infty} \frac{\lambda M g(M)}{\exp(\lambda M) - 1} \exp(\lambda M z) dM$$

We can make assumptions,
but if our assumptions are wrong,
our conclusions may well be wrong

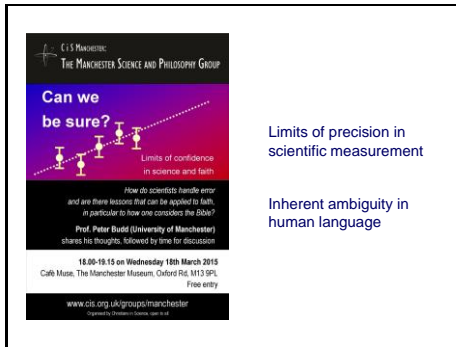
There are ways of “regularising” the problem,
but you have to make assumptions,
for example, that the molecular weight distribution has a particular kind of shape,
and, of course, if your assumptions are wrong, your answer may well be wrong.

In science, some problems turn out to be mathematically “ill-posed”.

THEOLOGICALLY ILL-POSED PROBLEMS

We can make assumptions,
but if our assumptions are wrong,
our conclusions may well be wrong

And when it comes to interpreting the Bible,
there are some questions that could be described as theologically “ill-posed.”
There’s a degree of imprecision in human language.



Limits of precision in scientific measurement

Inherent ambiguity in human language

That’s something I’ve discussed previously at one of these meetings (18th March 2015), in a talk on “Can we be sure? Limits of confidence in science and faith”, a transcript of which you can download from the group webpages.

When we look at some of the very compact passages of the Bible, in Genesis, for example,

I, personally, am convinced they reflect reality at many different levels, but that doesn’t necessarily mean we can reconstruct every detail with certainty.

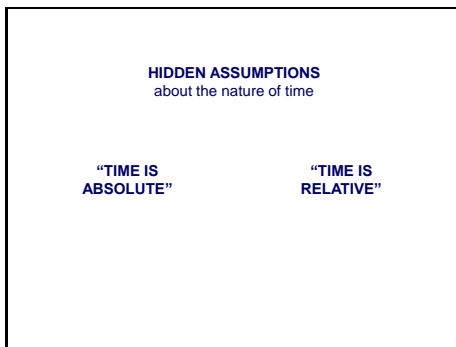
The inherent ambiguity of language leaves open many possibilities.

If we make certain assumptions, we can draw rational conclusions, but, of course, if our assumptions are wrong, our conclusions may well be wrong.

So, if we honestly regard the Bible as authoritative, we need to be honest about the assumptions we make.

And accept that different assumptions may lead to different conclusions.

When we read the opening chapters of Genesis, we inevitably bring certain assumptions to our interpretation.



And one key respect in which we make assumptions – often without realising it – is about the nature of time.

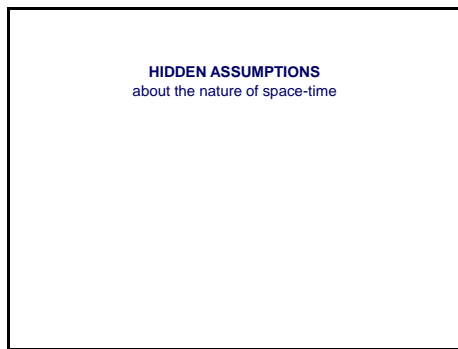
It makes a difference, for example, whether we think of time as absolute, whether we think in terms of a master clock, tick-ticking away, that’s the same for everyone, and everything, and even for God, or whether we think of time as relative,

whether we think, like Einstein,

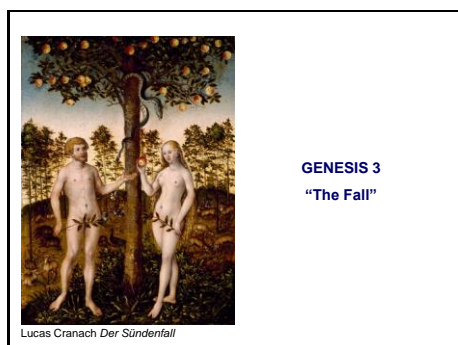
that time will be different for observers moving relative to each other, whether we accept that God may not be bound by time in any sense as we are, other than in the incarnation.

It makes a difference when we read in Genesis about the “days” of creation.
If we think of time as absolute, we can talk of “literal” days,
because a day is a day is a day.
But if we think of time as relative, we have to ask,
“a day for who or for what?”
Until the sixth day, there’s no man to perceive time.
Until the fourth day, there’s no sun to mark time.
In the beginning, there’s only God,
and it’s at least arguable as to whether He is bound by time.

The way we think about time, influences how we interpret what the Bible says about creation,
and there lies the root of at least some of the fuss about creation and evolution.
Some of this I’ve discussed previously,
in the talk on “When is a day not a day?”



So let’s move on to consider other assumptions,
not just about time,
but about the whole nature of what nowadays can be called “space-time”.



Let’s focus on the events described in Genesis chapter 3.
Events involving a serpent and a woman and a man in a garden.
Events often referred to as “The Fall”, although that is not a Biblical term.
It’s in Genesis 3 that the greatest theological difficulty lies,
when considering evolution and creation.
It’s thinking about “the Fall” that prompts many intelligent, rational individuals
to adopt a “creationist” viewpoint.

Those events,
the serpent encouraging the woman to eat a certain fruit,
the woman eating, and encouraging the man to eat,
and their subsequent banishment from the garden,
those events have enormous theological significance.

When we look for answers to some of the greatest philosophical and theological questions...

Questions like

“If there’s a God of love, why is there so much pain and suffering in the world?”

and

“Why did Jesus have to die such a horrible death on a cross?”

When we look for answers to those sorts of questions,

the trail leads back to the events in that garden.

If we dilute the significance of those events,

it undermines the whole of Christian theology.

And, at least at first sight, it can seem hard to match a slow evolutionary progression,
with the idea of a world that “after the Fall” is very different to “before the Fall”.

That’s what leads some Christians passionately to oppose evolution.

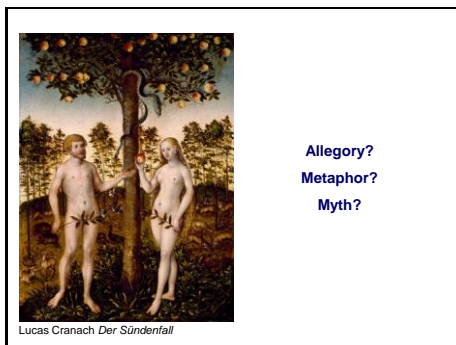
And that’s what leads some atheists to push evolutionary ideas

way beyond the evidence,

from the physical into the metaphysical.

So, can the story of Eve and Adam and their banishment from the garden,

be married with evolution?



One approach is to treat the story in Genesis 3 as allegory, metaphor or myth.

Where the word “myth” is used not in the popular sense,

of a made-up story with no basis in fact,

but in the technical sense,

of a story intended to convey deep, spiritual truths

that cannot be conveyed in any other way.

However, while that may be a valid approach,

it’s not a very satisfactory approach.

It seems to lose the impact and immediacy of the simple narrative.

Many Christians feel, quite reasonably, that the story presents something more “real”,

than is suggested by words like “allegory”, “metaphor” or “myth.”

So is there a better approach?

It's always a good idea to go back to source material, in this case, the Bible, and ask
"What does it actually say, and what doesn't it say?"

And in so doing, ask oneself

"What assumptions am I bringing to my interpretation, and are they valid?"

Now the LORD God had planted a garden
in the east, in Eden;
and there he put the man he had formed.

Genesis 2:8

Now if we look at the Biblical account,
we read of the man being put in the garden, (*Genesis 2:8*)

So the LORD God banished him
from the garden of Eden
to work the ground
from which he had been taken.

After he drove the man out,
he placed on the east side
of the Garden of Eden
cherubim and a flaming sword
flashing back and forth
to guard the way to the tree of life.

Genesis 3:23,24

and subsequently being banished from the garden,
"to work the ground from which he had been taken." (*Genesis 3:23*)

And we read that the way back to the garden is guarded. (*Genesis 3:24*)

There's no way back.

In other words, the events referred to as "The Fall" took place
somewhere other than where the man was made,
somewhere now inaccessible.

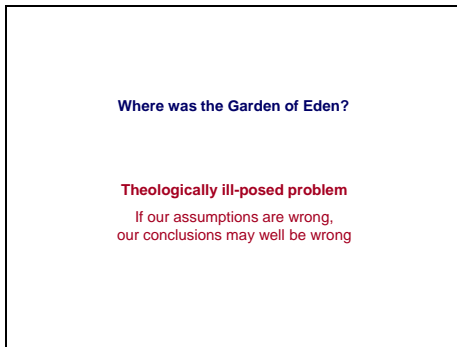
A river watering the garden
flowed from Eden,
and there it separated into four headwaters.

Genesis 2:10

The geography where the garden is set,
has familiar elements,
but doesn't quite match anything we now see.

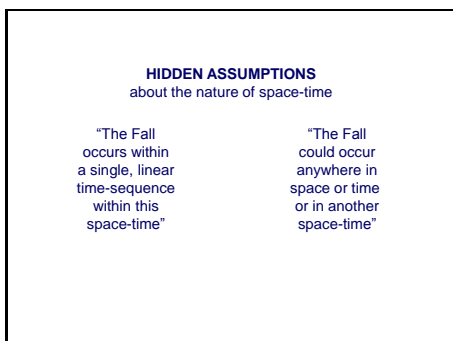


The Hebrew word used to locate the garden – qedem – has a variety of meanings,
which may involve space, “in front” or “east”;
or involve time, “before” or “long ago”.



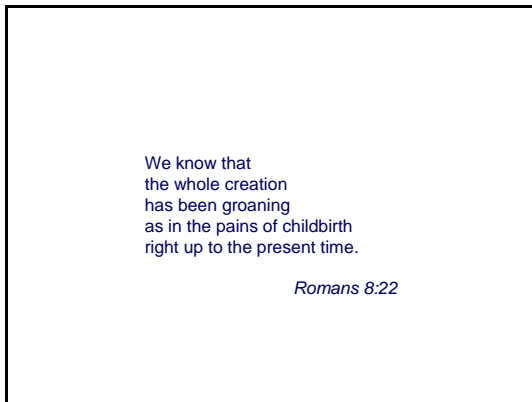
So, if we ask the question “Where was the garden of Eden?”
an enormous variety of answers are consistent with the Biblical data.
It's a theologically “ill-posed problem.”

Of course, we can make assumptions.
But if our assumptions are wrong, our conclusions may well be wrong.



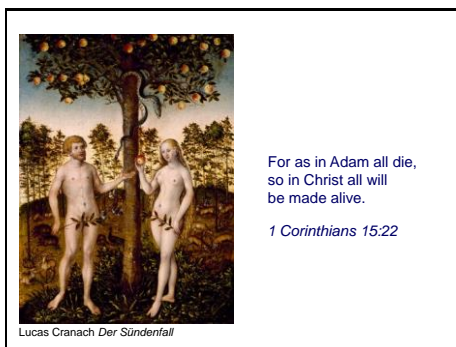
An assumption many people make is that the events we call “The Fall”
are located within a single, linear time-sequence within this space-time.
So, going back in this earth's time, they expect a distinctly different “before” and “after”.

But the garden could be anywhere in space or time, or in another space-time. And it may be that the effect of “the Fall” is felt throughout this space-time. In which case, there may not be a distinctly different “before” and “after”, that we can perceive in our present condition.



The situation that existed in the garden is inaccessible to us. What we see is the “whole creation,” as the Apostle Paul put it in Romans 8:22 “groaning in the pains of childbirth right up to the present time.”

Now, for the Christian trying to understand what God has done, this can all seem very confusing. But what matters isn't the detail of what may or may not have happened.



What matters is the effect of “the Fall”, and the solution to be found in Jesus Christ. The reality of events in that garden may be far beyond anything our limited imaginations can comprehend. And when it comes to arguments about “evolution” and “creation”... Perhaps it's appropriate to show a little humility.

Surely I spoke of things
I did not understand,
things too wonderful
for me to know.

Job 42:3

Perhaps the best response is one like the response Job gave,
after all his suffering and pain,
after all the clever, but ultimately misguided, arguments of his friends were done,
after his encounter with God himself...

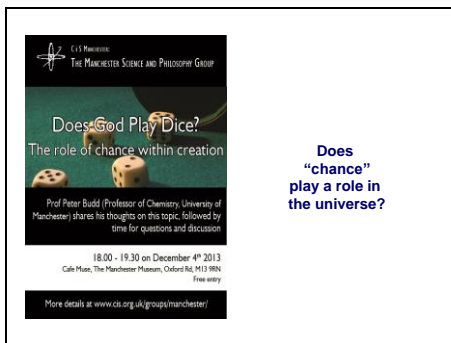
Job 42:3

“Surely I spoke of things I did not understand,
things too wonderful for me to know.

If we look, honestly and objectively, at the Biblical evidence,
it doesn't exclude the possibility of an evolutionary process within creation.
But we may need to recognise something that
most experimental scientists learn from bitter experience.
That reality can be far more interesting, far more complex, far more surprising,
than we at first assume.

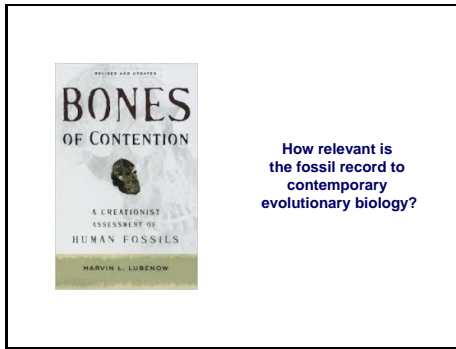
Evolution and Creation: What's all the fuss about?

There are many other things we could consider, if we had more time.

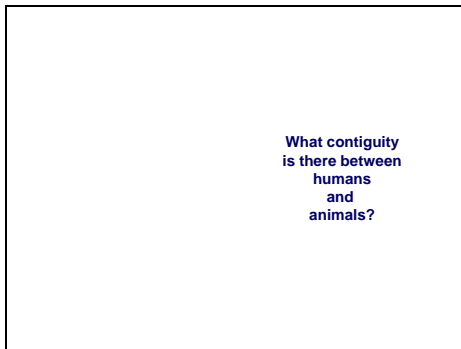


For example, the role that probabilistic events
– chance, randomness –
may play in the universe.

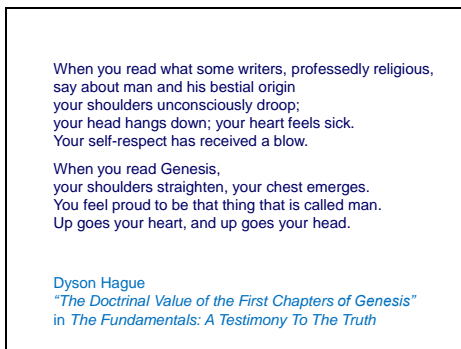
Actually, that's something I've discussed previously
at one of these meetings (*4th December 2013*),
in a talk on “Does God Play Dice? The role of chance within creation”,
a transcript of which you can download from the group webpages



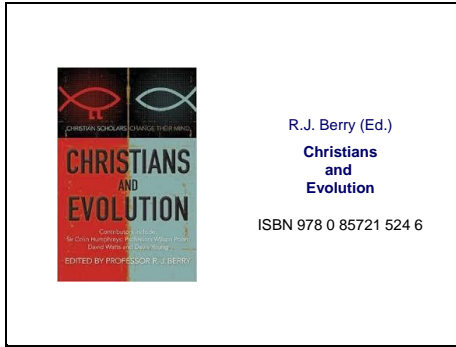
If we had more time, we might consider
the relevance of the fossil record to contemporary evolutionary biology.
Personally, I'm not sure it has much relevance at all,
but no doubt a palaeontologist would say otherwise.
And I'm grateful to Stephen, who sent me a copy of the book "Bones of Contention."



If we had more time, we might discuss
the contiguity between humans and animals.



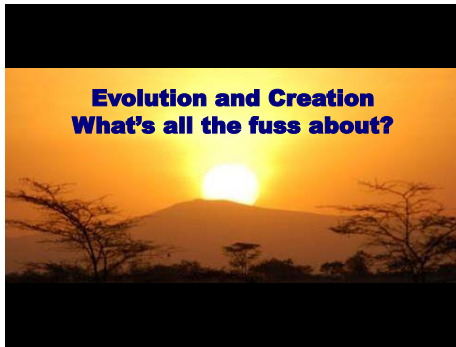
Some people just don't like the idea of humans being related to apes.
As expressed by Dyson Hague in "The Fundamentals".
The collection of essays from the early 1900s,
that contributed to what became known as "Fundamentalism."
But the problem here seems to be simply one of human pride.
The sort of pride expressed by the temptation in that garden.
The sort of pride that C.S. Lewis described as "The Great Sin." (*Mere Christianity*)



If you want to read more about Evolution and Creation, there are, of course, many books on the subject.

One I should mention is “Christians and Evolution”,
Since one of the contributors is our very own David Watts.

If we had more time, there’s much more we could talk about.
But the key point is this.



Evolution and Creation: What’s all the fuss about?

As far as I can tell, the fuss largely arises

from misconceptions and questionable presuppositions.

But I may be wrong.

So, over to you, for discussion.

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