

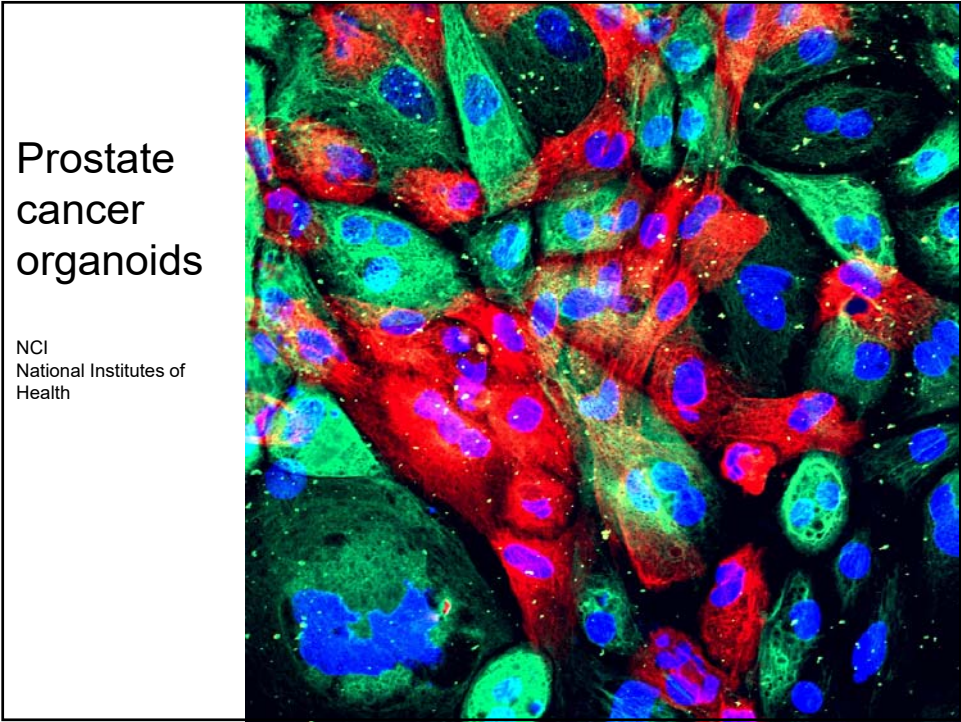
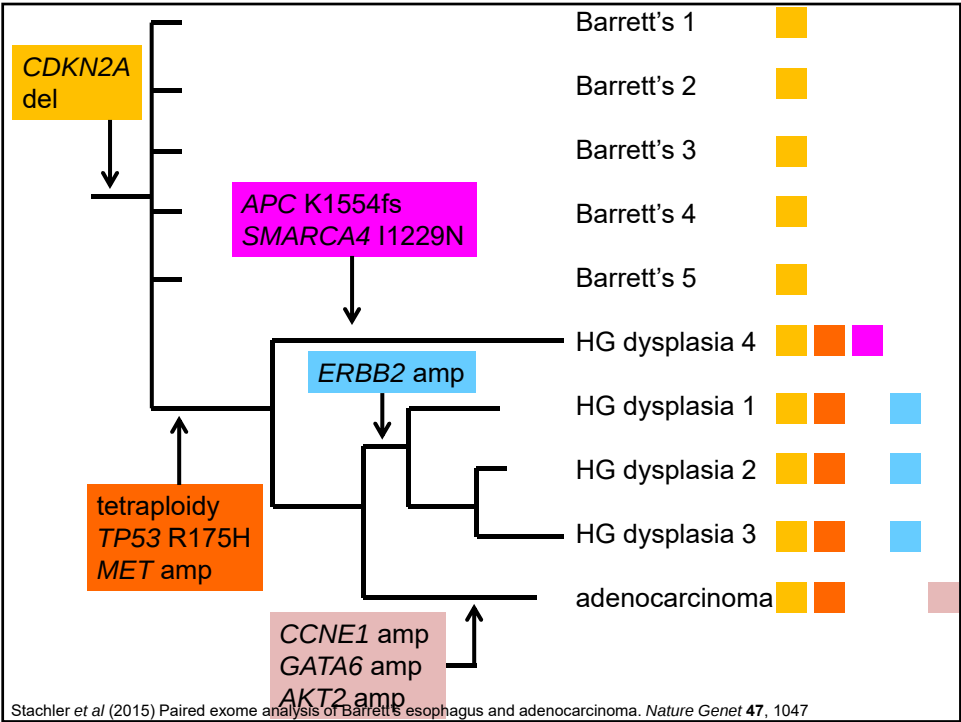
Genetics, Evolution, Cancer, Suffering and God

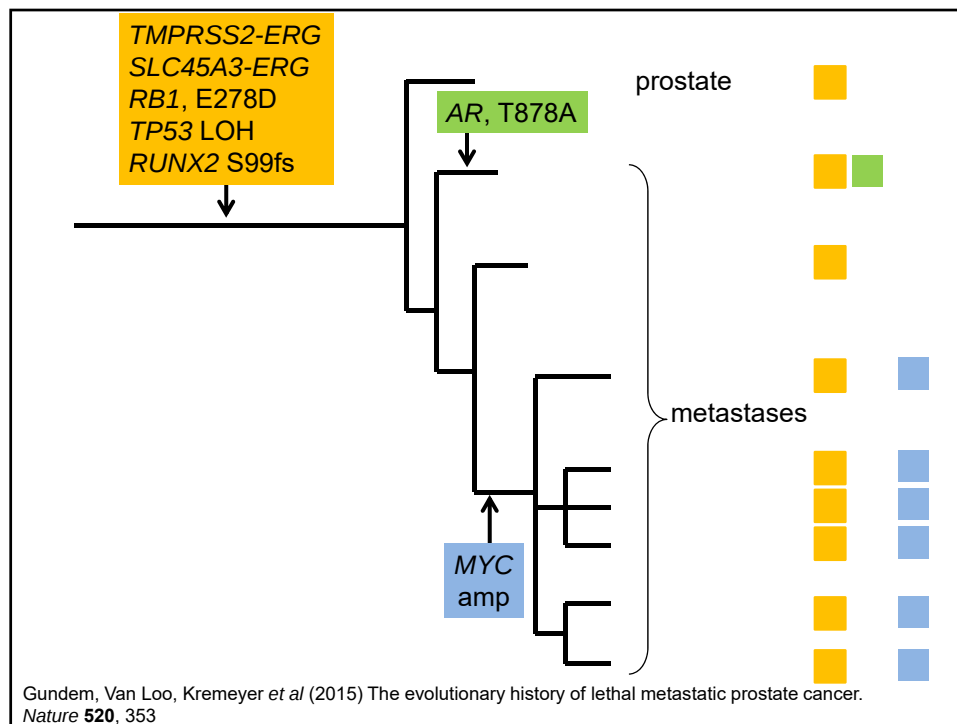
7 July 2016
Robert Menzies College

Graeme Finlay
g.finlay@auckland.ac.nz
University of Auckland

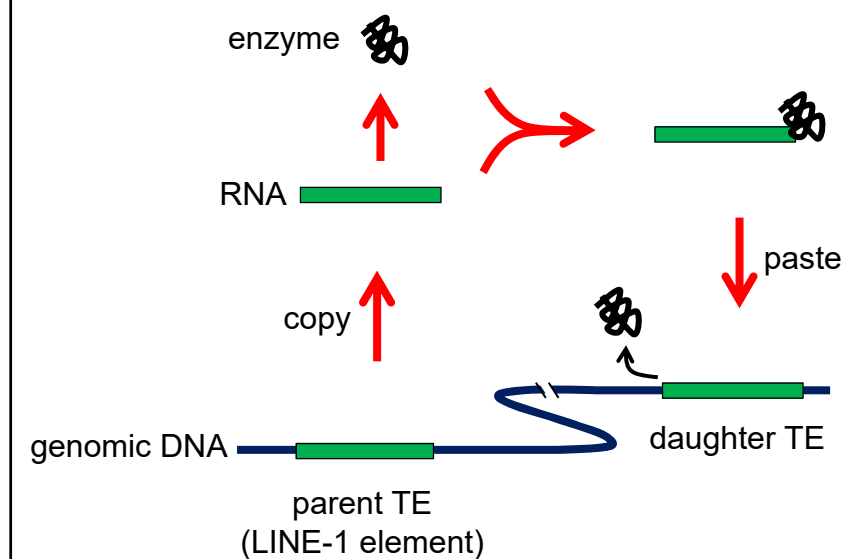
Oesophageal carcinoma
(SqCC)







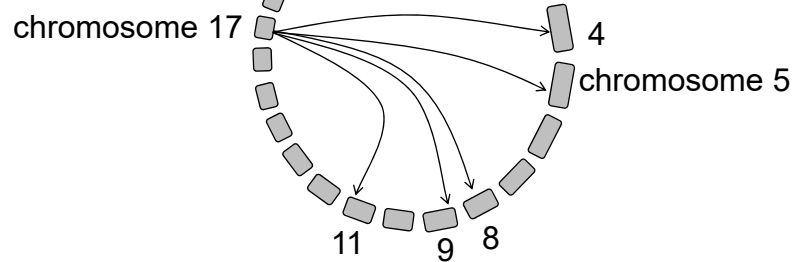
How retrotransposons copy-and-paste



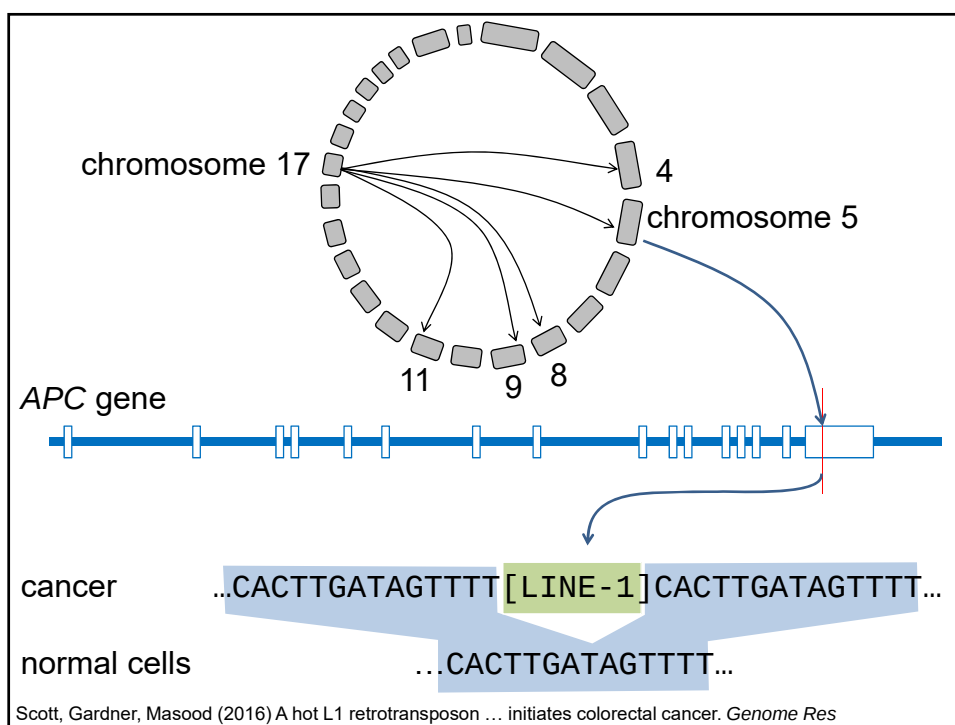
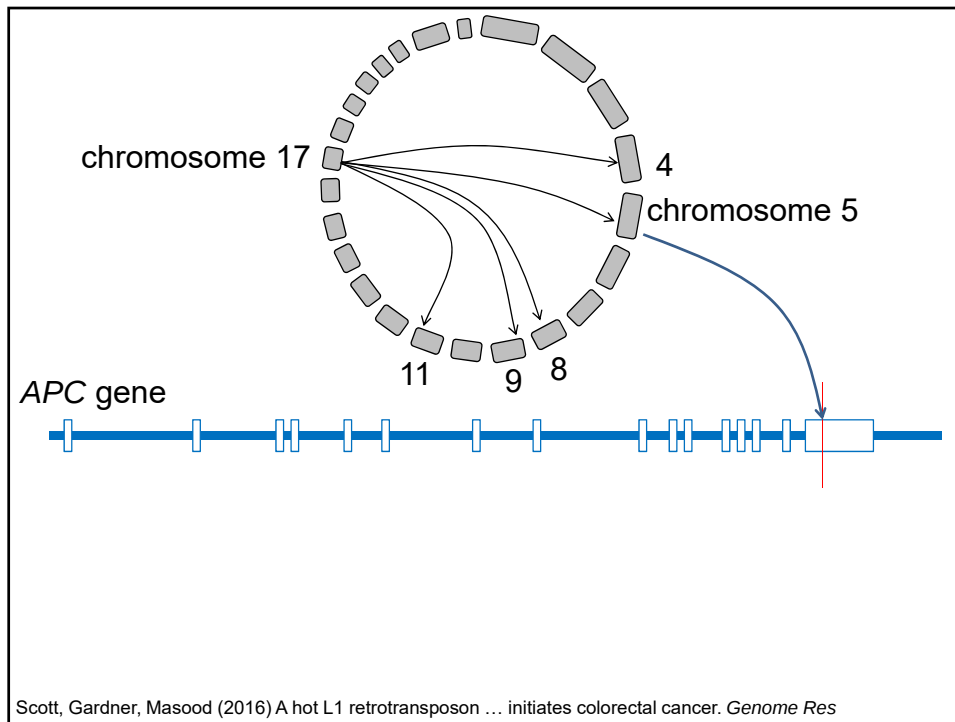
Colon cancer

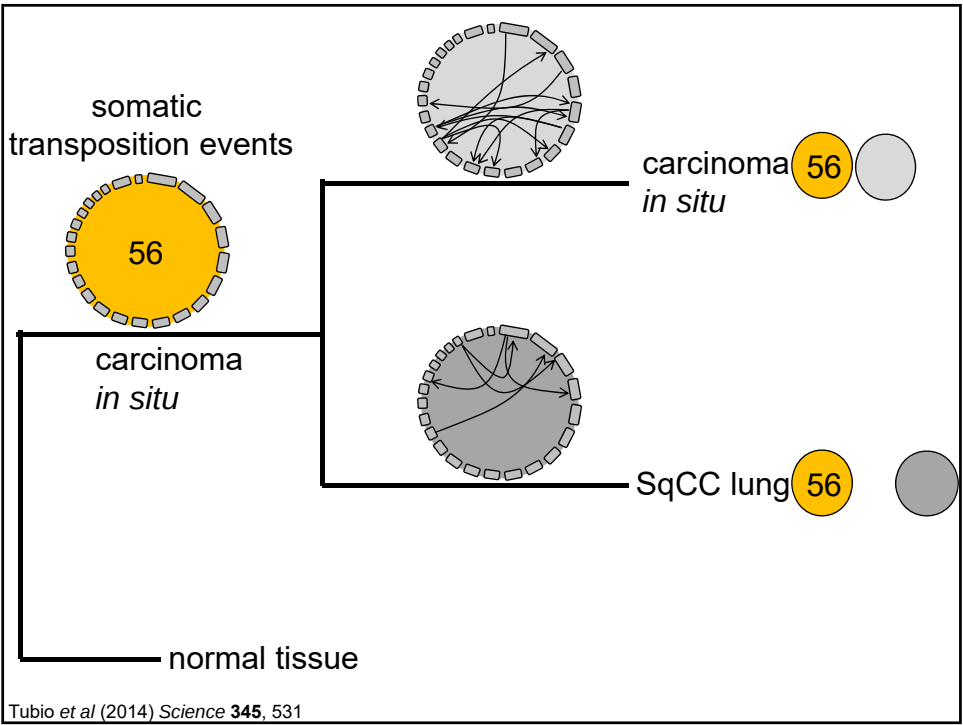
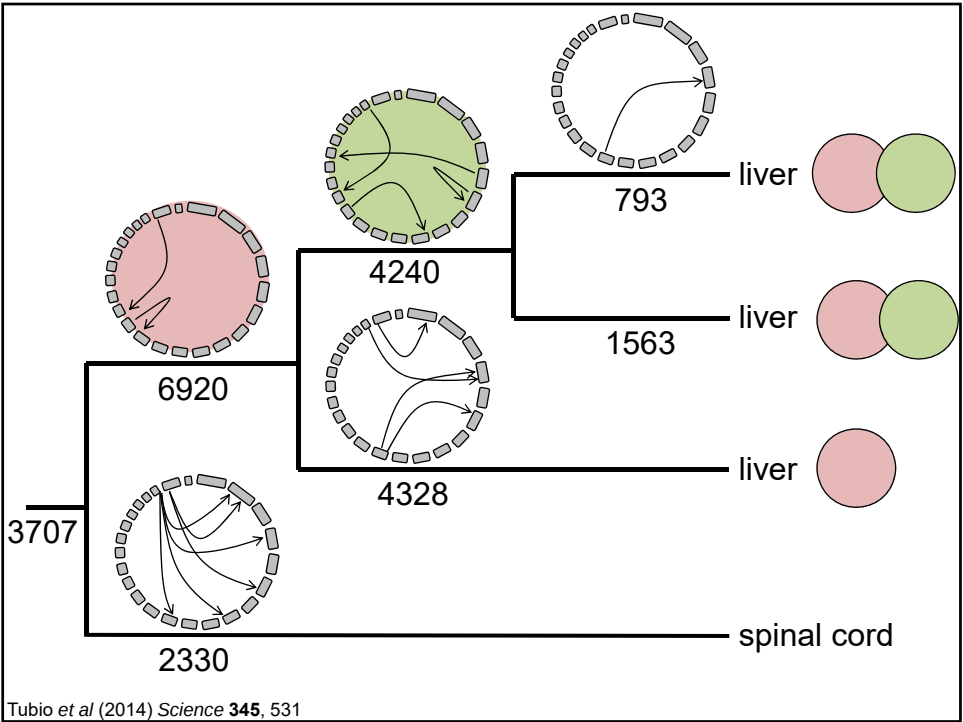


65.72.02



Scott, Gardner, Masood (2016) A hot L1 retrotransposon ... initiates colorectal cancer. *Genome Res*

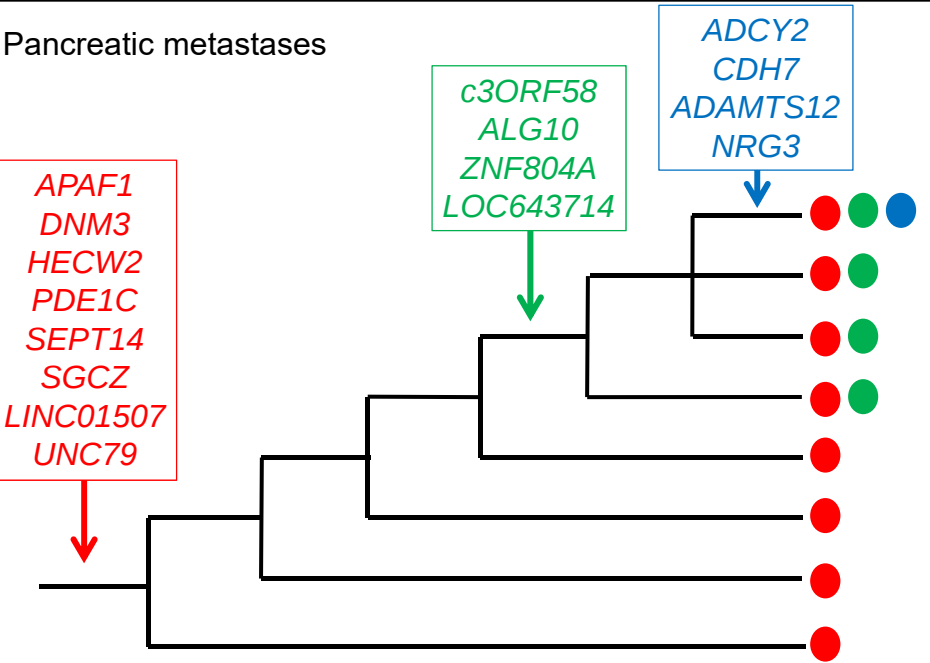




pancreatic carcinoma



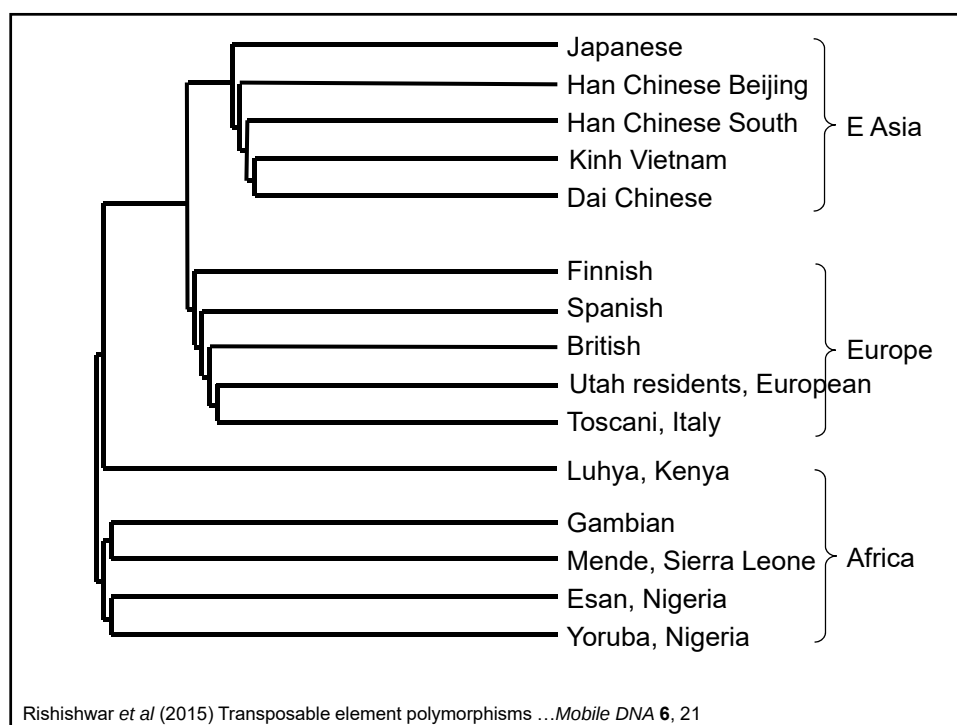
Pancreatic metastases

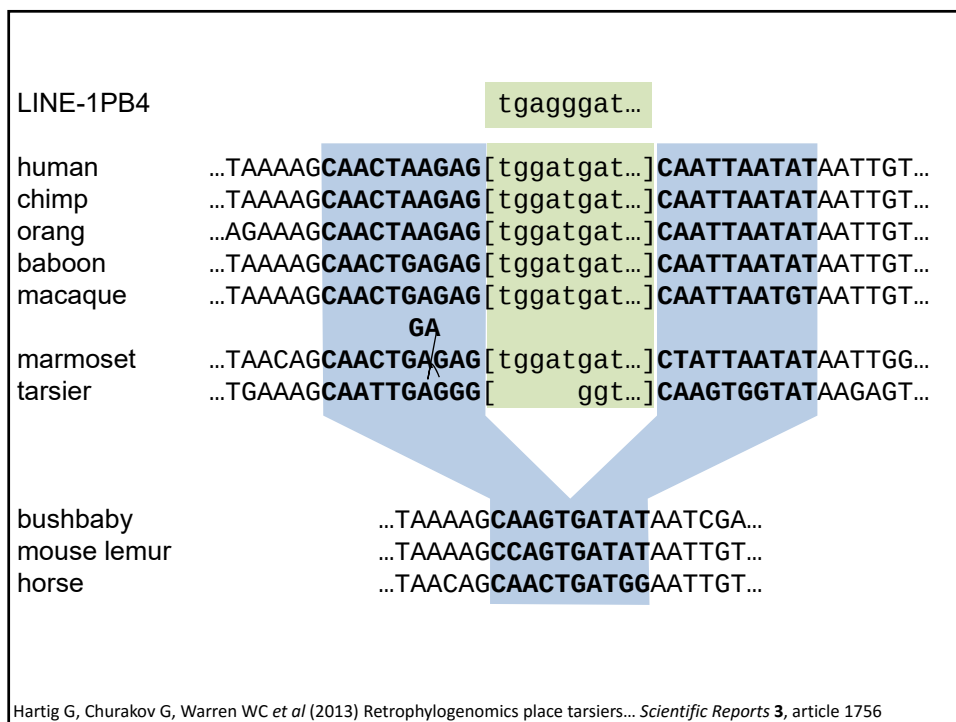
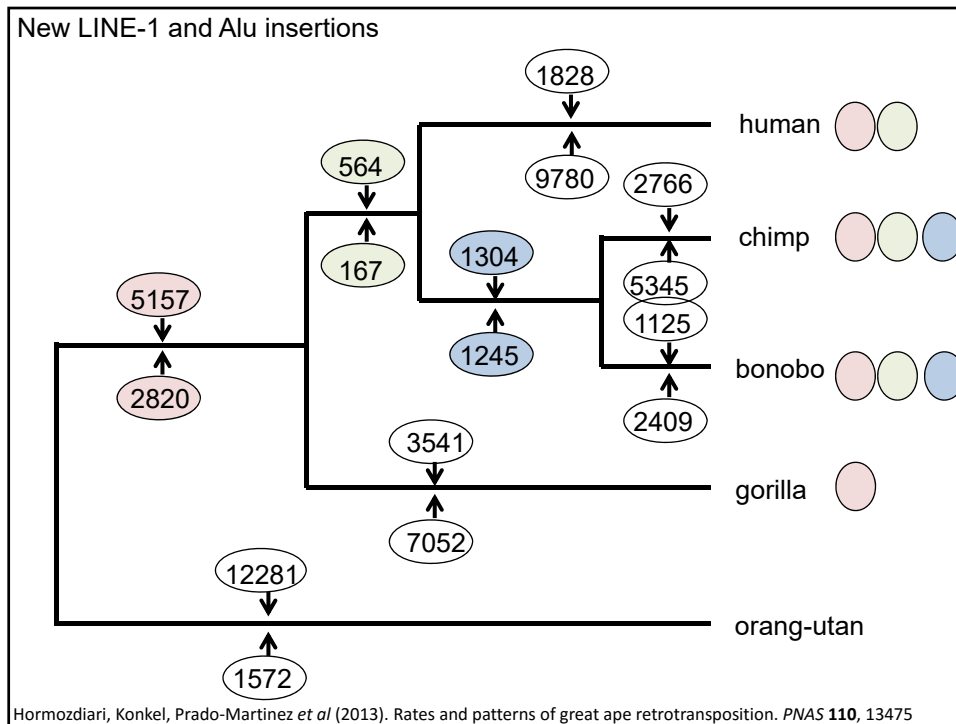


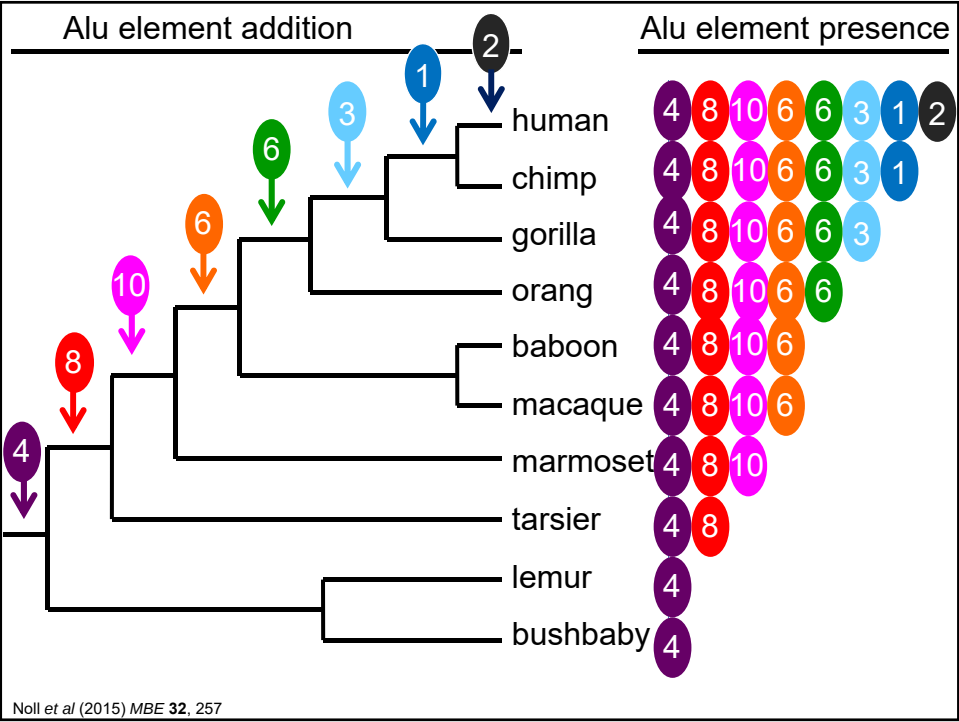
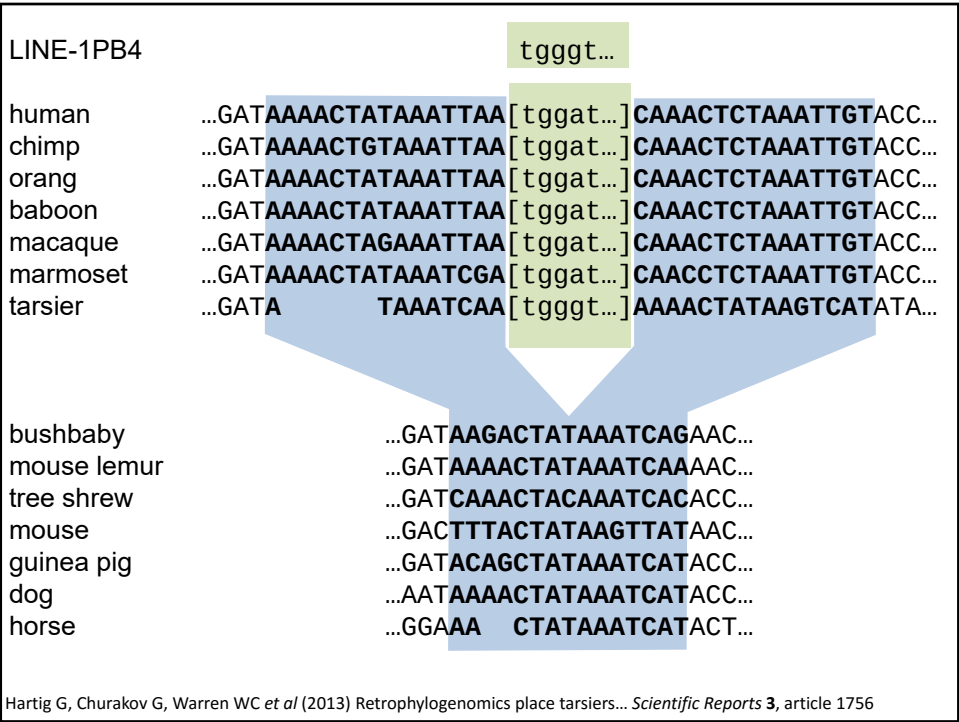
Rodic N, Steranka JP, Makohon-Moore A *et al* (2015). Retrotransposon insertions in the clonal evolution of pancreatic ductal adenocarcinoma. *Nature Med* 21, 1060

Such retrotranspositions are somatic...

There are also retrotranspositions in the germ line







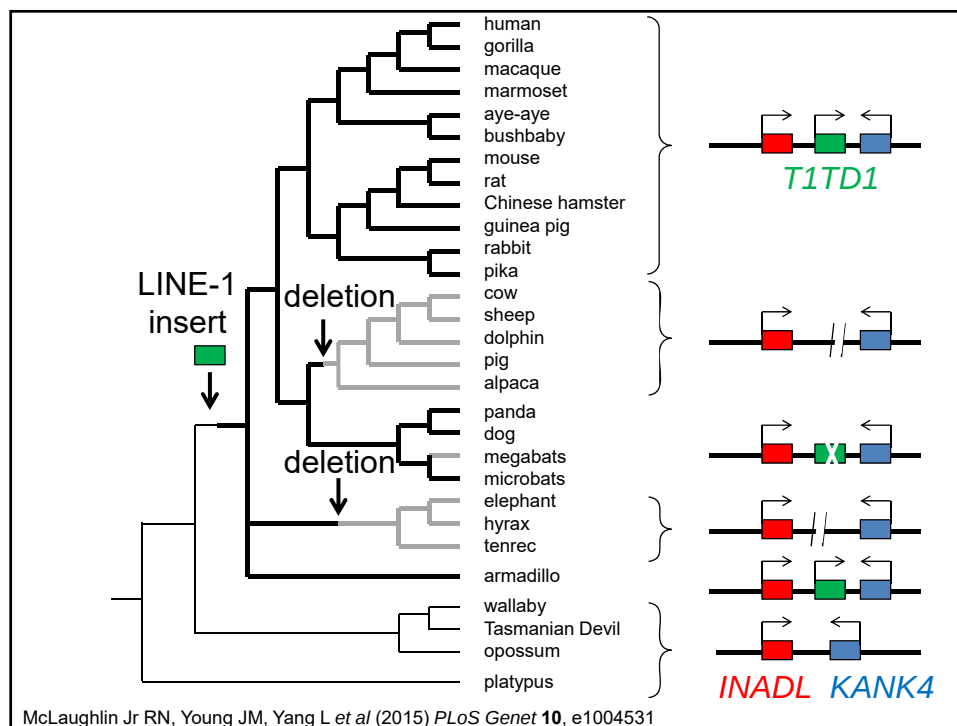
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human	...AATGTGATGCCTTGGATCTAGA ...	GAATGCTCCA	...	...
chimp	...AATGTGATGCCTTGGATGTAGA ...	TCCA	...	...
horse	...AATAAGATGCTTTGGATTTAGA ...	GAAT CTCCATAACCGTGC...		
pig	...CATACAATGCCTTGGATTGGGA ...	GA CATAACCTTGC...		
Seba's s/t bat	...AATGTGATGGCT GGATTGGGA ...	GAATACTCCACATCCGGGC...		
flying fox	...AATATGATGCCTC GATTGGGA ...	GAATACTCCATACCCAGGC...		
elephant	...AATACGATGCCTCCGATTTCGA ...	GCTTACTCTATAAACCATGA...		
manatee	...AATATGATGCCTTGGATTTAGA ...	GCTTACTATATAAACCATGA...		
golden mole	...AATATGATGCCTTGGATTAAA ...	GTTGACTCTTGAGATTG ...		
aardvark	...AAGATGATAGCTTGGATTTAGA ...	GTTTACTCTCTAACCTTGA...		
armadillo	...AATATGATGCCTTGGATTTACA ...	GAATTCTCTTTATCCATGC...		
reconstructed	...AATATGATGCCTTGGATTTAGA ...	GAATACTCT-TA-CC-TGC...		

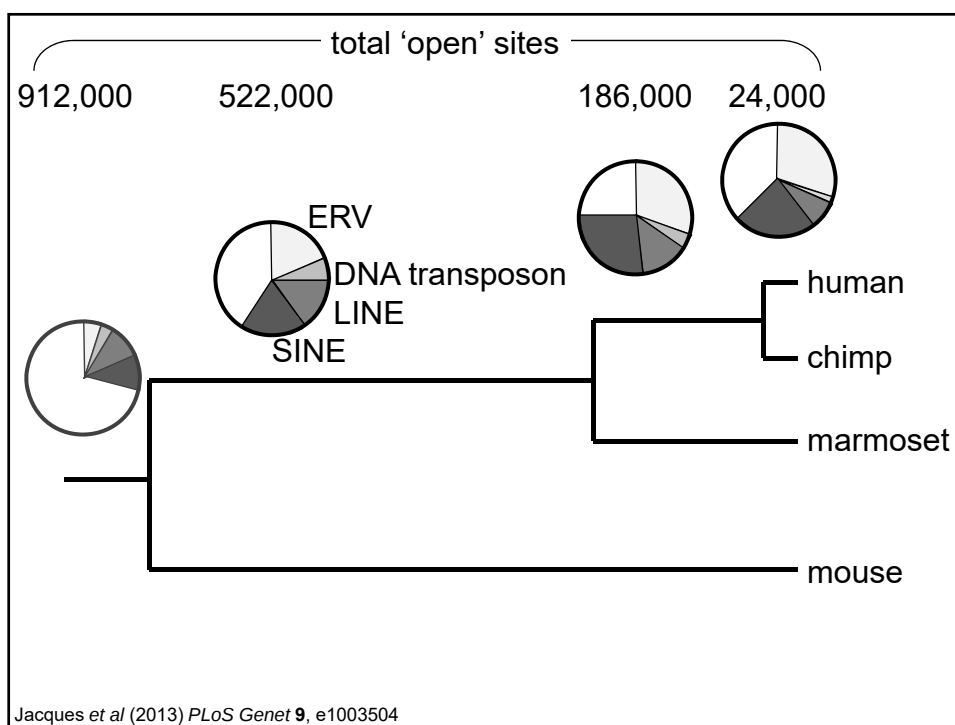
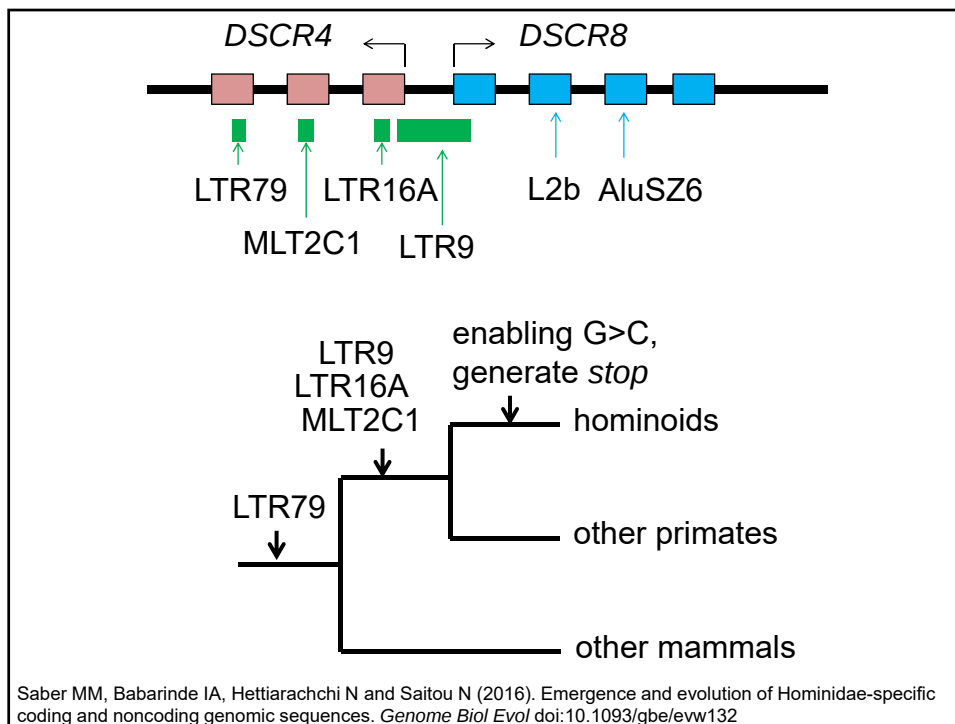
Lee A, Nolan A, Watson J and Tristem M (2013) Identification of an ancient endogenous retrovirus...
Phil Trans Roy Soc B **368**, 20120503

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orangutan	...AGGAAAGGTGGGCCAAAGACACA	TCCAGGAGGGG...
macaque	...AGGAAAGGTGGGCCAAAGACACA	TCCAGGAGGGG...
marmoset	...AGGAAAGGTGAGCCAAAGACACA	TCCAGGGGGGG...
squirrel monkey	...AGGAAAGGTGAGCCAAAGACACA	TCCAGGAGGGG...
squirrel	...AGGAAAGGTGGGTCAAAGCCACA	CCCAGGAGGGG...
prairie vole	...AGGAGAGGTGAGCCAAAGACACA	CCCTGGAGGG - ...
Chinese hamster	...AGGAAAGGTGAGCCAAAGACACA	GCCTGGAGGG - ...
golden hamster	...AGGAAAGGTGAGCCAAAGACACA	GCCTGGAGGG - ...
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star-nosed mole	...AGGAAAGGTGGGCCGAGGAACA	CCCAGGAGGGG...
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platypus	...AGGAAAGGTGGGACAAAGAAACA	ACAAAGAGGGG...
MIR-b	...ATAGTAAC TTGCCAAGGTCACACAGCTAG	

MIR-b

Retrotransposon contribute raw material for new genetic functionality



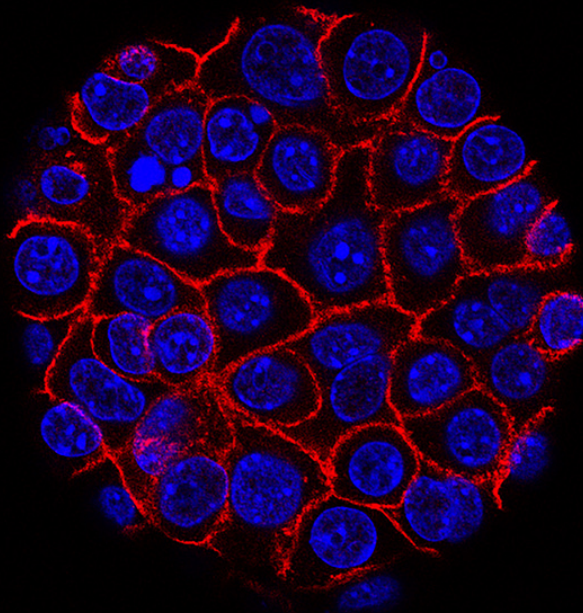


Questions arising...

Biological evolution is created history

But what about cancer evolution?

Pancreatic
cancer cells



National Institutes of Health

1 The issue does not rise only with biology

- mankind
- Israel
- the Church
- each of us

2 Free will – free process

‘I think the only possible solution lies in a variation of the free-will defence, applied to the whole created world. One might call it ‘the free process defence’. In his great act of creation I believe that God allows the physical world to be itself ... in the independence which is Love’s gift of freedom to the one beloved.’

Polkinghorne J (1989) *Science and Providence*, 66

2 Free will – free process

‘God no more expressly wills the growth of a cancer than he expressly wills the act of a murderer, but he allows both to happen. He is not the puppetmaster of either men or matter.’

Polkinghorne 1989, *Science and Providence*, 67; (1994) *S&CB*, 83-84

3 Does God *allow*?

‘If God allows sin and suffering, he remains answerable for them.’

König A et al (1988) *Systematic Theology: Doctrine of Creation* 2nd ed, 327

4 God's relationship with the world is covenantal

Two partners. God gives being, structure, and promises a destiny. Creation, whether impersonal or personal is free to be itself. 'Before God the Creator, we and our descendants and all living things are partners in the same covenant. ...All living things are partners in God's covenant.'

Moltmann: in Berry (2000) *The Care of Creation*, 111

4 God's relationship with the world is covenantal

'... animate creatures are suitable partners in a covenant.'

'For the time being, the covenant [God] makes is with all living creatures ..., not just with humans, for it was only within this community of creatures that God has ever envisaged his human creatures living.'

Bauckham (2010) *Bible and Ecology*, 20,25; from Gen 9:9-10, Hos 2:18

May we extend this: God acts in a covenantal way with all creation: he gives freedom to physical reality that he must respect.

5 Essential kenosis

The uncontrolling love of God

Phlp 2:5-11

‘Jesus’ kenotic life and death reveal that God engages in self-giving, others-empowering love.’

Oord TJ, *The Uncontrolling Love of God* (IVP, 2015), 160

5 Essential kenosis

‘To say kenosis is a necessary, eternal, and logically primary attribute of the divine nature means that God expresses kenosis inevitably.’

Oord TJ, *The Uncontrolling Love of God* (IVP, 2015), 161

5 Essential kenosis

‘Essential kenosis says that God’s self-giving, others-empowering nature of love necessarily provides freedom, agency, self-organisation and lawlike regularity to creation. Because love is the preeminent and necessary attribute in God’s nature, God cannot withdraw ...the freedom that God gives .’

Oord TJ, *The Uncontrolling Love of God* (IVP, 2015), 169

6 God suffers from creation

‘It is of decisive significance that this [OT] history reveals the essence of all history, and that history is genuine history (and not some kind of puppet-show) in which two covenant partners have their own responsibility, allocated to them respectively by God alone, but not executed by God alone.’

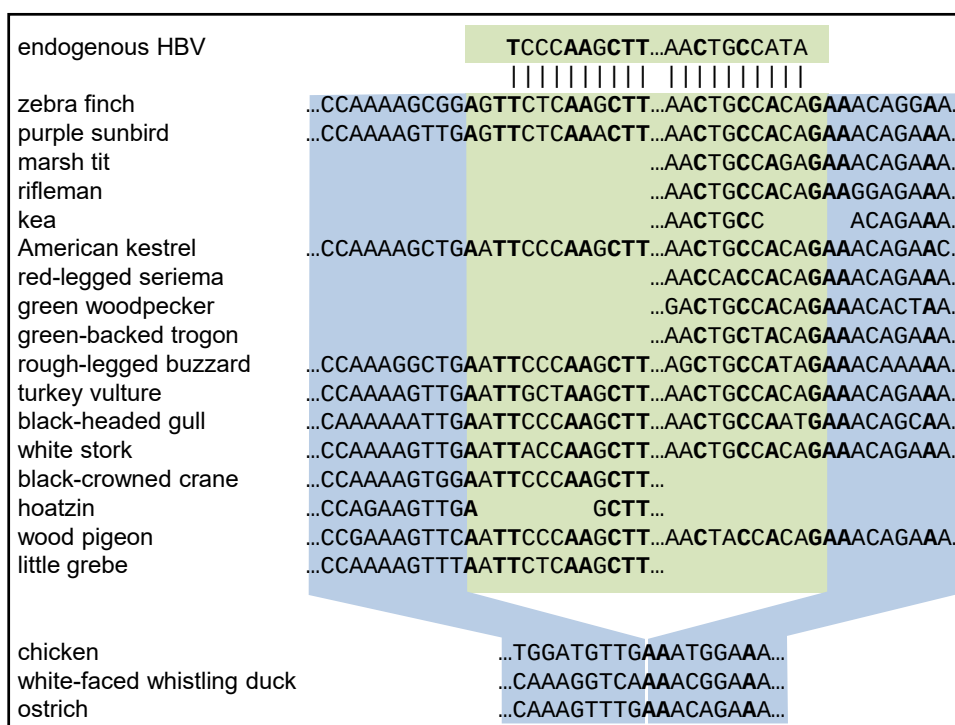
‘The greater part of history (that of Israel, the church, the world [and of inanimate nature!]) is in fact a violation of the will of God and has been other than he willed it to be.’

König (1982) *Here Am I*, 129-130

6 God suffers from creation

‘Not everything that happens is the will of God, since a great many things occur which are against his will.’ ‘The Bible abounds with things that happen against God’s will. This is a consequence of the covenant structure through which God deals with man, since through the covenant he gives man the opportunity to make a substantial contribution to history.’

Konig *et al*, 327, 332



‘...not a sparrow falls to the ground
without your Father

[knowing/ being there/participating/
empathising]

‘God is involved in his children’s
distress.’

Mt 10:29; Konig *et al* 382

Two models of care....



'Do you not heed the helpless sparrow's falling?
Can you not see the tears that women weep?
Can you not hear your little children calling?
Do you not watch over them as they sleep?

'Do you not heed the helpless sparrow's falling?
Can you not see the tears that women weep?
Can you not hear your little children calling?
Do you not watch over them as they sleep?

Then, O my God, you are too great to love me,
Since you do reign beyond the reach of tears.
Calm and serene as the cruel stars above me,
High and remote from human hopes and fears.

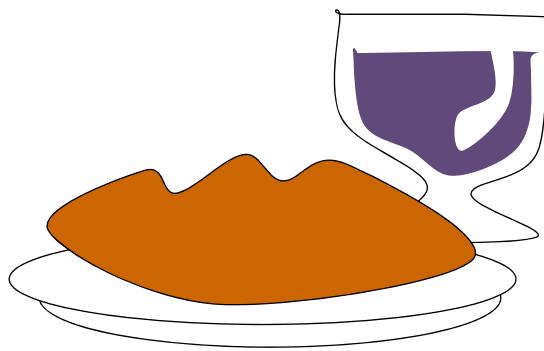
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Do you not watch over them as they sleep?

Then, O my God, you are too great to love me,
Since you do reign beyond the reach of tears.
Calm and serene as the cruel stars above me,
High and remote from human hopes and fears.

Only in Him can I find home to hide me,
Who on the cross was slain to rise again,
Only with Him my Comrade God beside me
Can I go forth to war with sin and pain.'

Studdert Kennedy

7 God suffers for creation



8 An eschatological doctrine of God

Creation is incomplete.

König, Here am I, 179

‘Our confession of God’s omnipotence assures us that he does not abandon our chaotic history, but still guides it to its destination.’

König et al, 332

‘The Bible promises that there will come a time in the future when God will reign over all things. And *then* nothing will happen without his will; *then* he will be all in all (1Cor 15:28 NEB); *then* it will be heaven on earth; *then* the traditional doctrine of providence will be true – on the new earth.’

König *et al* , 331