

The world's smallest motor—ATP synthase

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END - 5TH OCT 2018, SUNSHINE COAST, AUSTRALIA

Ever heard the following?

"Scientists don't believe in God"

"Science has all the answers to man's questions...."

"Science is based on evidence, but Christianity is based on faith"

Great scientists who were Christians

Faraday,
Maxwell,
Fleming
Morse etc


$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$
 $\nabla \cdot \mathbf{H} = 0$
 $\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$
 $\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$



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Great scientists in the present who are also Christians

- Andrews
- Burgess
- Lennox
- McIntosh
- Nevin
- Etc.



Science grew out of a Christian worldview !

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The limitations of science

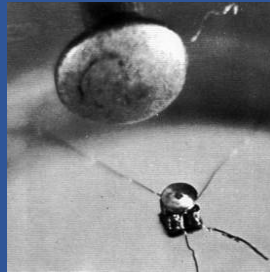
- Science does not address all the questions...
Usually 'How...?' or 'What...?' but not 'Why...?'
e.g. 'Why did Mum make the cake?'



William McLennan's motor - 1960

$1/64'' = 0.4 \text{ mm} = 400,000 \text{ nm}$

2,000 rpm

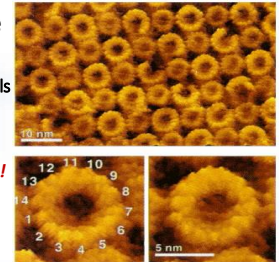


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Electron micrograph of the world's smallest motor

'ATP synthase', the motor in your cells
200,000 x smaller than McLennan's motor

1,000 x smaller than a human hair !

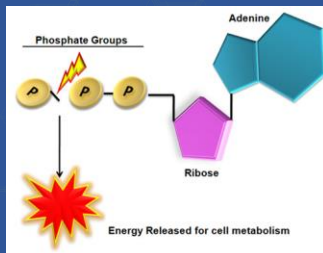


What is ATP?

... the 'energy molecule' of living cells



ADP is a 'used' ATP molecule



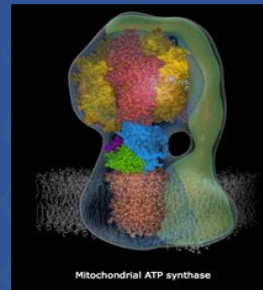
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What is ATP synthase?

The machine that makes ATP

Produces our body weight of ATP each day

Speed 7,000 rpm, efficiency 99% +



Mitochondrial ATP synthase

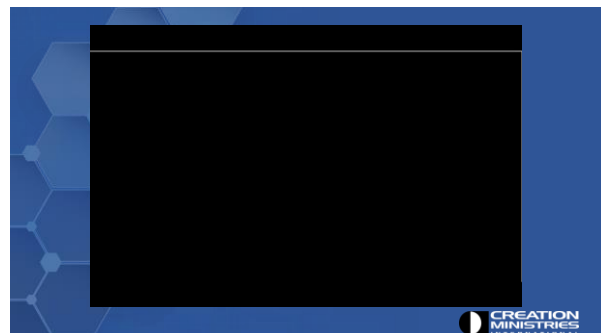
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ATP Synthase – how does it work?

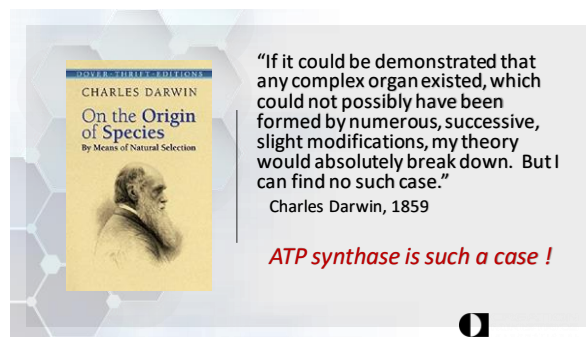
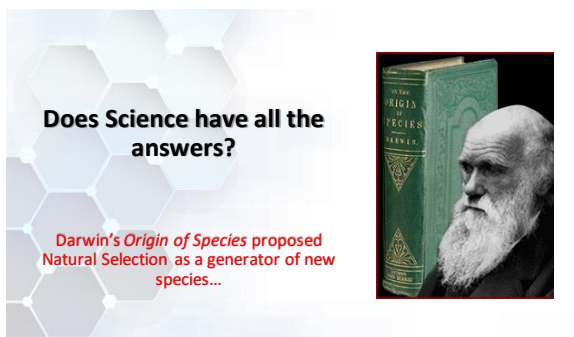
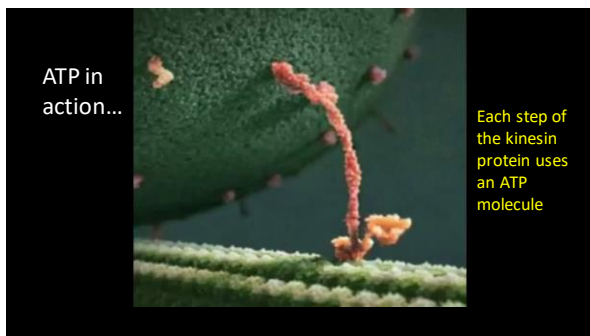
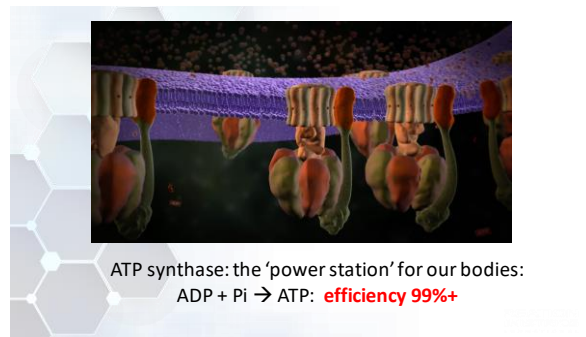
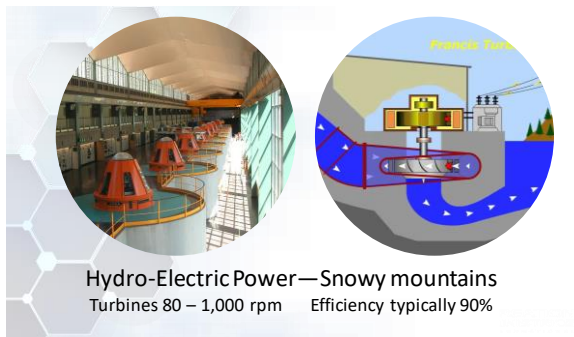
1. Loads ADP + P_i
2. Changes ADP to ATP
3. Release of ATP



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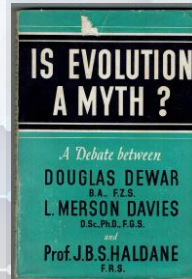
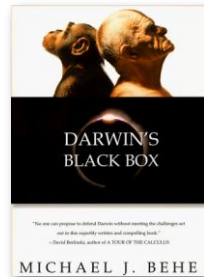


Accident or Design ?

Objective indicators of design:

- Specified complexity (information)
- Order, interdependence, & purpose
- Irreducible complexity—'it all works or nothing works'

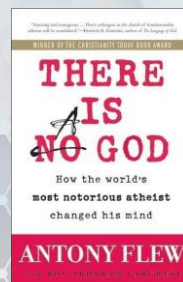
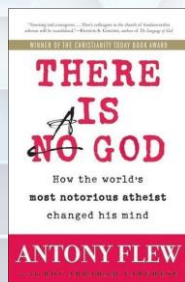
ATP synthase has it all!



"That is why one finds no example of various mechanisms, such as the wheel and magnet, which would be useless till fairly perfect"

J.S.B Haldane, 1949

ATP synthase is such an example !



"What I think the DNA material has done is show that intelligence must have been involved in getting these extraordinary diverse elements together,"

Professor Antony Flew, University of Reading, Associated Press report (2004)



Ever heard the following?

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A wrong view of faith...

"Faith is the great cop-out, the great excuse to evade the need to think and evaluate evidence. Faith is belief in spite of, even perhaps because of, the lack of evidence."

Richard Dawkins



A right view of faith...

- Judgment based on reasonable evidence
- Trust in a reliable person



We all exercise faith, every day!



Christianity: evidence-based

1. The evidence of Creation:

- Where did everything come from?
- We live in a finely tuned Universe
- How did life begin?
- Design everywhere... e.g. ATP synthase!



For the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made; even His eternal power and Godhead.
Romans 1:20



Christianity: evidence-based

2. The evidence of the Bible:

- Claims to be the Word of God (3,600 times)
- Teachings unsurpassed
- Never proven wrong, always correct
- Predictive prophecy fulfilled in detail



Psalm 22

They pierced my hands and my feet...they look and stare at me... they divide my garments among them, for my clothing they cast lots..."

Written 1,000 BC, 300 years before crucifixion was invented. Fulfilled in detail when Jesus was crucified.

One of hundreds...



Christianity: evidence-based

3. Christ:

- The central figure of human history—BC:AD
- Eyewitness accounts of life, teaching and miracles

He claimed to be God:

"I and my Father are one" John 10:30

Rose from the dead 3 days after crucifixion



Christianity: evidence-based

After His suffering, He showed Himself alive by many infallible proofs, being seen of them forty days.

Dr Luke (Acts 1:1-3)



The facts of the case...

- Christ lived
- Christ died
- His tomb was empty
 - Resurrection predicted
 - In the Old Testament
 - By Christ Himself
- Seen alive by hundreds of witnesses
 - Friends – doubters – enemies



'He was seen...': direct evidence

- Seen on twelve occasions by more than 520 witnesses over a period of forty days
- Mary Magdalene, Thomas (John 20)
- Cleopas and friend on the road to Emmaus (Luke 24)
- The apostles (Matthew 28, Mark 16, Luke 24, John 21)
- The apostle Paul (Acts 9)



The empty tomb

"He is not here, for He is risen, behold the place where He lay"

Matthew 28:9



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Lord Lyndhurst Lord Chancellor

"I know pretty well what evidence is; and I tell you, such evidence as that for the resurrection has never broken down yet."



FRANK MORISON
Skeptic

"The book that refused to be written"

Frank Morison

WHO
MOVED
THE
STONE?

Christianity: evidence-based

4. The evidence of changed lives

Then...

Peter the denier, Thomas the doubter, Paul the persecutor, Mary Magdalene, Lydia the merchant

Throughout History...

Augustine – the immoral

Elizabeth Fry – prison reformer

John Newton – slave trader

Still happening today!

Questions to the atheist...

- Where did everything come from?
- How did a fine-tuned system like ATP synthase arrive by chance?
- How did life arise spontaneously from dead matter?
- Where did my mind come from?
- How do you explain the Bible, the life, death and resurrection of Jesus Christ?



To sum up...

- Many great scientists, past and present are Christians
- Science does not have all the answers
- Complex systems like ATP synthase have all the hallmarks of marvellous design
- Christianity is evidence-based
- **God can be personally known through Jesus Christ**



Revelation 3:20

"Behold, I stand at the door and knock. If any man hear my voice and open the door, I will come in to him, and will eat with him, and he with me."

—Jesus Christ

