

**Please answer the following six questions:**

**October 27th:**

*How old is the Earth?*

**November 3rd:**

*How much does the Earth weigh?*

**November 10th:**

*Can a mother be younger than her daughter?*

**November 17th:**

*Why do we need quantum mechanics?*

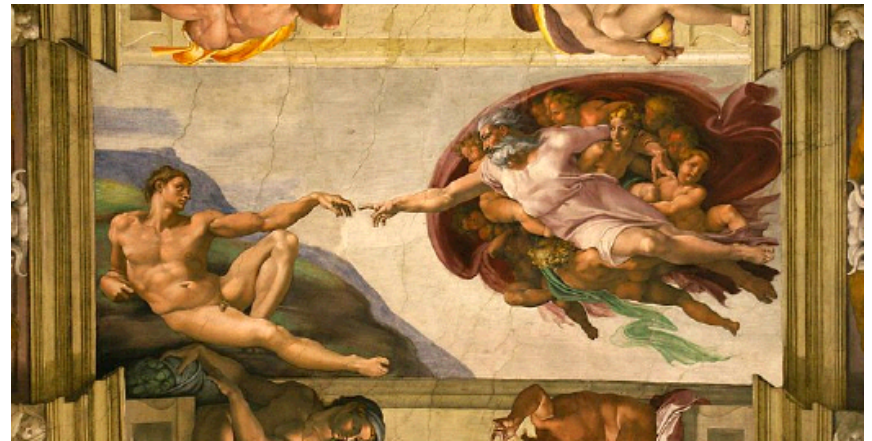
**November 24th:**

*How will the universe come to an end?*

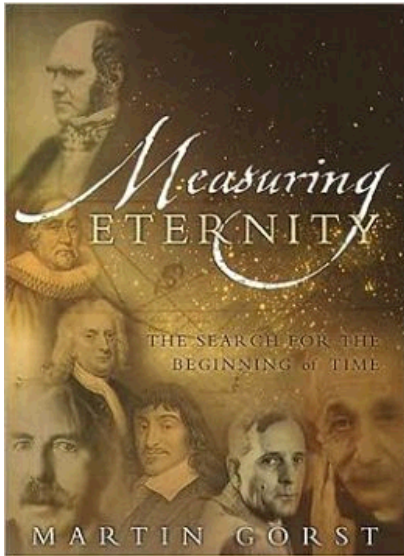
**December 1st:**

*Why do musical instruments sound different from each other?*

**HOW OLD IS THE EARTH?**



*The Creation of Adam, painted on the Sistine Chapel Ceiling  
by Michelangelo (ca 1511 - 1512)*



Measuring Eternity:

The Search for the Beginning of Time

by Martin Gorst

## THE BABYLONIAN GREAT YEAR

1 year  $\Rightarrow$  360 days

1 Great Year  $\Rightarrow$  36,000 years

$\Rightarrow 36,000 \times 360 = 12,960,000$  days

## THE HINDU MAHAYUGA CYCLE

1 Kalpa  $\Rightarrow$  1000 Mahayugas  $\Rightarrow$  4 · 32 billion years

1 Mahayuga (4 · 32 million years)  $\Rightarrow$  4 Yugas  
(time length in the ratio 4 : 3 : 2 : 1)

- 1st yuga  $\Rightarrow$  1,720,000y (*a golden age* )
- 2nd yuga  $\Rightarrow$  1,290,000y (*an age of labor, pain and suffering* )
- 3rd yuga  $\Rightarrow$  860,000y (*a decadent age* )
- 4th yuga  $\Rightarrow$  430,000y (*a thoroughly evil age* )\*

\* According to the *Aryabhatiya*, a 5th century compendium of math and astronomy, we are currently about 5,116 years into a 4th yuga.



In Ancient Greece and Rome:

The *Great year* or *magnus annus* was a period of about 36,000 years. It was believed that the events of one cycle were simply repeated in the next; exactly the same people would return to Earth, and all that had happened would happen once again! Time itself was identical from one cycle to the next so there was no way to distinguish one cycle from another.



A 14th century copy of *De Civitate Dei contra Paganos* (The City of God Against the Pagans). It is a book of Christian philosophy written by St. Augustine of Hippo in the early 5th century CE in response to allegations that Christianity was responsible for the decline of Rome. He argued in favor of a linear concept of time, beginning with the Creation.



Father Martino Martini (1614 -1661) was an Italian Jesuit missionary, cartographer and historian, working mainly in ancient Imperial China.

## Selection of proposed dates of The Creation.

Josephus (37-95 CE) 4698/5402/5481/5555 BCE

Theophilus (2nd cent.) 5517 BCE

Bede (673-735 CE) 5199 BCE

Alfonso X (1221-1284) 6484/6984 BCE

Martin Luther (1483-1546) 3961 BCE

Johannes Kepler (1571-1630) 3993 BCE

Rabbi Lipman (1579-1654) 3616 BCE



(Left) James Ussher (1580-1656), appointed Archbishop of Armagh, the most senior position in the Church of Ireland, in January 1624.

(Right) John Lightfoot (1602-1675), Vice-Chancellor of Cambridge University and an eminent Hebrew scholar.

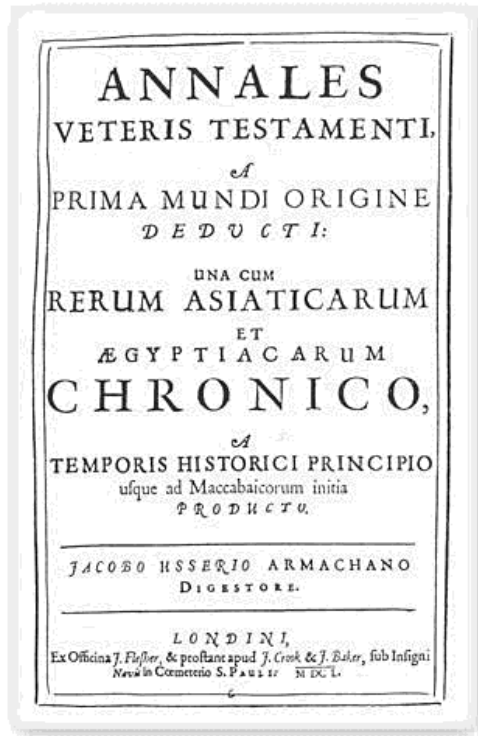
Which Bible to use?

- ***Greek Septuagint Bible***: used by the Orthodox Churches in Eastern Europe
- ***Hebrew Bible***: used by the Catholic and Protestant Churches in the West
- ***Samaritan Pentateuch***: an ancient version of the first five books of the Old Testament

	<u>Time period</u>	<u>Earth's age (yrs)</u>
<b><u>Creation</u></b>	7 days	0
Adam (930 y)		0
	130 years	
Seth (912 y)		130
	105 years	
Enos (905 y)		235
	90 years	
Cainan (910 y)		325
	70 years	
Mahalaleel (895 y)		395
	65 years	
Jared (962 y)		460
	162 years	
Enoch (365 y)		622
	65 years	
Methusalah (969 y)		687
	187 years	
Lamech (777 y)		874
	182 years	
Noah (950 y)		1,056
	502 years	
Shem (600 y)		1,558
	100 years	
Arphaxad (438 y)		1,658

<u>Time period</u>	<u>Earth's age (yrs)</u>
Arphaxad (438 y)	1,658
35 years	
Salah (433 y)	1,693
30 years	
Eber (464 y)	1,723
34 years	
Peleg (239 y)	1,757
30 years	
Reu (239 y)	1,787
32 years	
Serug (230 y)	1,819
30 years	
Nahor (148 y)	1,849
29 years	
Terah (205 y)	1,878
130 years	
Abraham (175 y)	2,008
100 years	
Isaac (180 y)	2,108

<u>Event</u>	<u>Earth's age (yrs)</u>
Abraham enters	2,083
Canaan when 75	
430 years	
Jewish Exodus	2,513
479 years	
Start of the Temple	2,992
428 years	
Destruction of the Temple	3,417
25 years	
Death of Nebuchadnezzar I	3,442
Ussher fixed Nebuchadnezzar's death in 562 BCE. So, The Creation occurred in	
$3442 + 562 = 4004$ BCE.	



James Ussher's *The Annals of the Old Testament from the beginning of the World.*

First published in Latin in 1650. Published, posthumously, in English in 1658.



“Ussher’s dates”

Creation began at 6.00pm on:

*Saturday October 22, 4004 BCE*

Adam & Eve driven from Paradise:

*Monday November 10, 4004 BCE*

Noah’s Ark landed on Mount Ararat:

*Wednesday May 5, 2349 BCE*





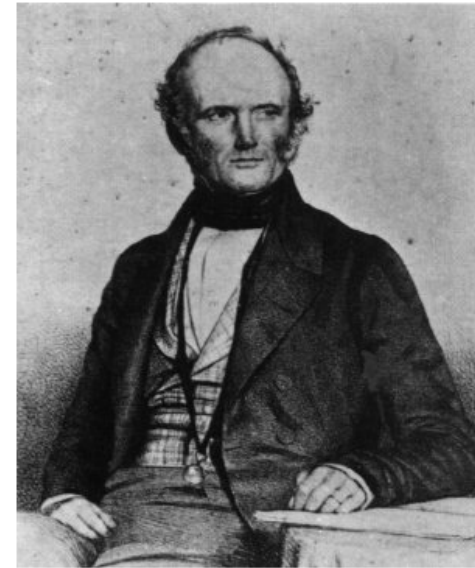
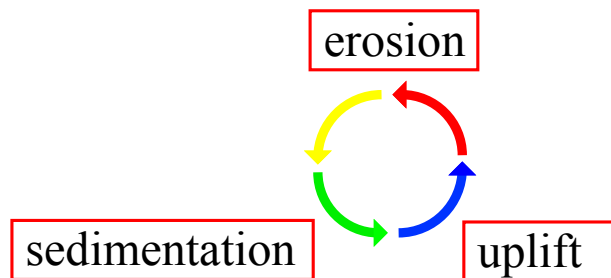
Statue of George-Louis Leclerc, Comte de Buffon (1707-1788) in the Jardin des Plantes, Paris, complete with a pigeon on his head!

## BUFFON'S CONJECTURES

- The planets were created at the same time by a comet colliding with the Sun. The planets would all be spinning, and maybe small amounts of material would be 'thrown' off forming moons.
- If the Earth was originally molten and spinning, it would explain why it is flattened at the poles.
- He could determine the age of the Earth on the basis of its cooling from a molten state to the present temperature.



Dr. James Hutton (1726-1797), gentleman farmer, who introduced the idea that the Earth operated on continuous cycles of erosion, sedimentation and uplift.



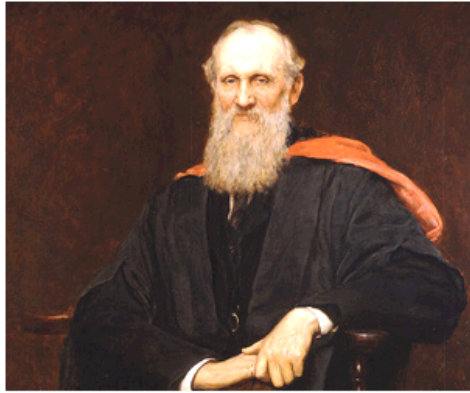
Sir Charles Lyell (1797-1875), who put together the first comprehensive theory of the Earth's geological features, based on Hutton's ideas.

## LYELL'S UNIFORMITARIANISM

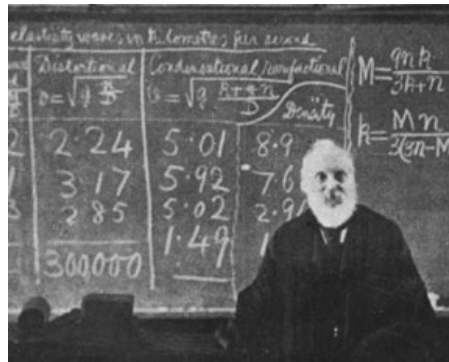
- The laws of nature are the same today as in the past, i.e., that laws are universal and unchanging.
- The same processes operate today as in the past.
- These processes operate at the same rate as in the past, i.e., very slowly.

## TWO INTERPRETATIONS OF GENESIS:

- The world was created in six days, but it was a re-cycled world. An indefinite period of many millions and millions of years may have passed between Genesis 1:1 and 1:2. Ussher's account applies only to the re-constituted world.
- The six days of Creation were not *literally* six days, but six *eras* that lasted an undefined period. The Biblical account covers only the final era, the history of the human race.



William Thomson (1824-1907), later Lord Kelvin of Largs, professor of physics, later Chancellor of Glasgow University and vice-Chancellor of Cambridge University.

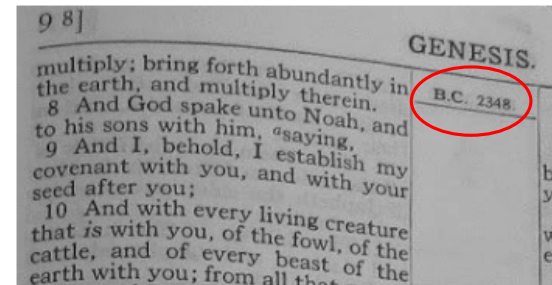


Lord Kelvin delivering his final lecture at Glasgow University in 1899.

## SCOFIELD REFERENCE BIBLE (1917)

CHAPTER 1. <i>The original creation.</i>	B.C. 4004.	upon the face of the deep. And the <sup>a</sup> Spirit of God moved upon the face of the waters.
<b>I</b> N the <sup>a</sup> beginning <sup>1b</sup> God <sup>2</sup> created the heaven and the earth.	<sup>a</sup> John 1.1. <sup>b</sup> <i>Deity</i> (names of). Gen.2.4,7. (Gen.1.1; Mal.3.18.)	<i>The new beginning—the first day: light diffused.</i>
<i>Earth made waste and empty by judgment</i> (Jer. 4. 23-26).	<sup>c</sup> <i>Holy Spirit.</i> Gen.6.3. (Gen.1.2; Mal.2.15.)	<b>3</b> And God <b>said</b> , Let there be <sup>4</sup> light: and there was light.
<b>2</b> And the earth was <sup>3</sup> without form, and void; and darkness was	<sup>d</sup> Job 26.13. Psa.104.30.	<b>4</b> And God saw the light, that it

“In the beginning ...” Genesis 1 (B.C. 4004)



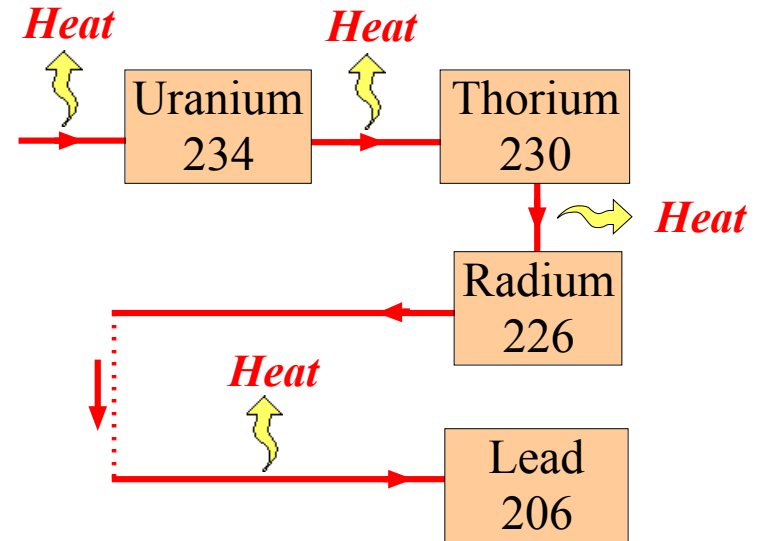
The Great Flood ... Genesis 9 (B.C. 2348)

CHAPTER 1. <i>The deity of Jesus Christ.</i> (Cf. Heb. 1. 5-13.)	A.D. 26.	was Light
<b>I</b> N the beginning was the <sup>1a</sup> Word, and the Word was with <sup>b</sup> God, and the Word was <sup>c</sup> God.	<sup>a</sup> Rev.19.13. <sup>b</sup> John 17.5. <sup>c</sup> Heb.1.8,13; 1 John 5.20. <sup>d</sup> Eph.3.9.	Jes ( 9 T light the <sup>h</sup> 10 world The
<b>2</b> The same was in the beginning with God.	<sup>e</sup> <i>Life (eternal).</i> John 3. 15,16,36. (Mt.7.14; Rev.22.19.) <sup>f</sup> Or, apprehended; lit. laid not hold of it.	
<i>His pre-incarnation work.</i> (Cf. Heb. 1. 2.)		

Gospel of St. John (A.D. 26)



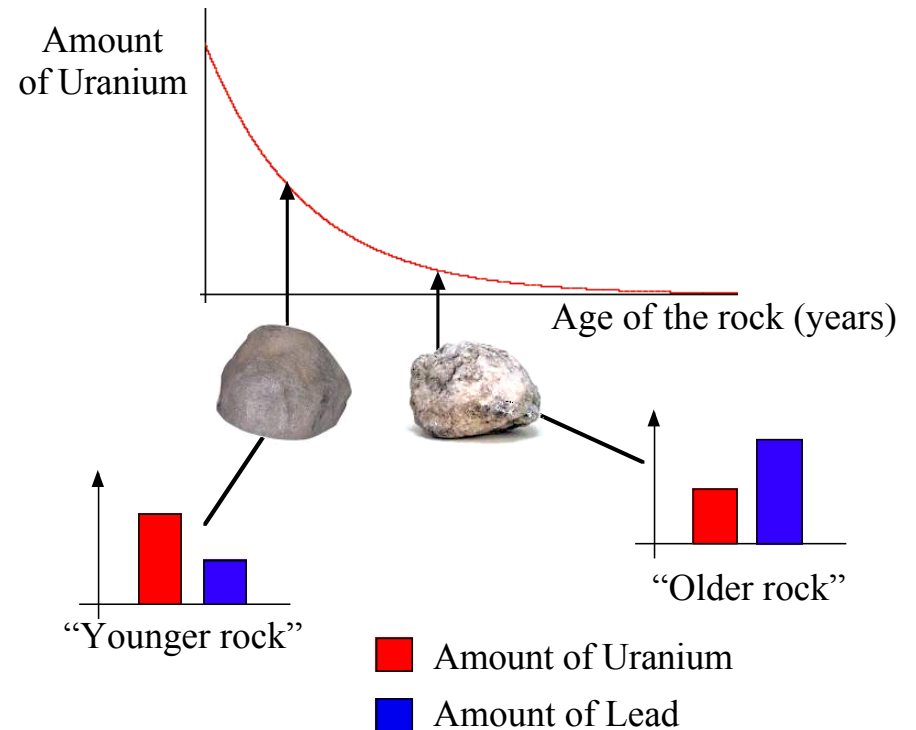
Antoine Henri Becquerel (1852-1908), the French scientist who discovered natural radioactivity in 1896.



Part of the radioactive decay chain from uranium to lead; altogether there are 14 steps. Each step can take from seconds to millions of years. Over the lifetime of the Earth - *4.6 billion years* - about 50% of the initial uranium in the Earth has been converted to lead.

## THE EFFECT OF THE DISCOVERY OF SPONTANEOUS RADIOACTIVITY ON THE AGE OF THE EARTH DEBATE

- It provided an explanation of the error in Kelvin's analysis; in 1905 the British physicist Lord Rayleigh confirmed Ernest Rutherford's suggestion that heat from radioactivity was one of the missing factors in Kelvin's calculations.
- It provided a new method of dating the Earth more accurately.



By measuring the ratio of the amount of lead to the amount of uranium in a rock sample, it is possible to determine the age of the rock. The greater the ratio, the older the rock.



The *Canyon Diablo* meteorite was part of the 50m asteroid that formed the mile-wide Barringer Crater in Arizona (below). The meteorite weighs 2.68 kg (5.8 lbs) and its age is  $4.55 \pm 0.7$  Byr .

