

SOME THOUGHTS ON TIME

Iain James

12 September 2007

Part 1

1. In his introduction, the lecturer says he will look at time from three perspectives. What are they?
2. When do physicists believe the universe began?
3. What is the critical phase he mentions that happened 360,000 years ago?

Part 2

4. How were stars formed?
5. In the beginning, what elements existed in the first generation stars?
6. What is the 'yellow dwarf'? What is its lifetime?

Part 3

7. How did the early planets form?
8. Why is the earth unique in the solar system in having a big moon?

Part 4

9. Why does the earth not have a similar surface to Mercury?
10. Why were the stromatolites the dominant life form for the first 3,500 years of the earth's history?

Part 5

11. How did the blue green algae alter the atmosphere of the earth to enable more complex organisms to develop?
12. What were the first creatures to form The Fossil Record some 500 million years ago?

13. What is the name of a primitive fish, only known as a fossil, which was discovered alive in deep waters off the African coast?

Part 6

14. What example does the lecturer give of a recent collision between an asteroid and a planet?
15. Which event does the lecturer say caused the extinction of the dinosaurs?
16. When does the lecturer suggest that the first hunter-gatherers lived on the earth?

Part 7

17. What was the fundamental change that allowed humans to evolve so quickly?
18. What was the invention that gave impetus to the technological society which came into being in the 19th century?
19. What does the lecturer show that can be deduced from the life line or time line exercise?

Part 8

20. What type of time is the third sort called '*kairos*' by the lecturer?
21. In the poem 'The Bright Field' what observation is the poet making?

Key

Part 1

1. 1) View of time from the physical science perspective
 2) From the life science point of view and
 3) From his own point of view
2. 13.7 billion years ago.
3. The universe became transparent, and radiation could pass through it instead of colliding with things.

Part 2

4. From matter collapsing due to the effect of gravity attraction into globular clusters which became the first stars.
5. Hydrogen and helium only.
6. It is the name given to our own sun. It has a lifetime of about 12 billion years, halfway through it now

Part 3

7. They formed from gasses of the sun, which originally formed a disk around the sun, and material gradually stuck together and grew bigger into small planets.
8. The earth originally collided with another planet, which knocked it off its axis, and some of the fragments and particles of the earth were thrown off onto the colliding body which together formed a larger moon than is normal.

Part 4

9. Because it has water flowing over large parts of the earth and because of volcanism and so on.
10. Because there was no other life form on earth to attack them.

Part 5

11. They used photosynthesis which gradually increased the oxygen levels in the atmosphere so allowing the development of more complex life forms.
12. These were the hard shelled creatures such as the crustaceans and molluscs.
13. A coelacanth.

Part 6

14. In 1994 Comet Shoemaker-Levy impacted on the planet Jupiter.
15. A collision between the earth and an asteroid or comet.
16. About one million years ago.

Part 7

17. The beginnings of language and later written language to pass information from one generation to another.
18. The steam engine which provided power to factories and also provided quick and easy transport for people and manufactured products.
19. That people remember the important events in their lives but not the day to day events which soon fade from memory.

Part 8

20. It is the time when things come together for us, perhaps when an important personal decision is made.
21. That we must treasure the moment, the time we are living in, and not long for the past or the future.