Christians in Science Lecture 8 at St Peter's Church Frimley 20th February 2018

'God in the Lab: When Curiosity leads to Wonder, Awe and the Big Questions of Life'

Dr Ruth Bancewicz

Dr Bancewicz is a Senior Research Associate at The Faraday Institute for Science and Religion in Cambridge (UK) where she works on the positive interaction between science and faith. She has developed the Test of Faith resources and in 2015 published a book with the above title – 'God in the Lab, *How science enhances Faith'*. Earlier in her career Ruth studied genetics at Aberdeen University followed by a PhD at Edinburgh University (based at the MRC Human Genetics Unit). Her postdoctoral research was carried out at The Wellcome Trust Centre for Cell Biology in Edinburgh where she coupled research with work as the Development Officer for Christians in Science, described as 'escaping' from the lab! Ruth is an enthusiastic communicator on science/faith issues and her current project is entitled 'Wonders of the Living World' which she hopes to publish in 2019 in a highly-illustrated format She attends the City Church in Cambridge.

By way of introduction (to an audience of 91), Ruth showed a slide of the Milky Way pointing out that the universe is in fact 'hospitable' to life as we know it. The presence of compounds containing the common elements carbon, hydrogen, nitrogen and oxygen – the constituents of living creatures – is not proof that God exists, nor would she attempt to use science for that purpose in her talk, but she hoped nevertheless to show there was compatibility between science and faith. She enjoyed dealing with questions relating to life but many of these do require theological answers. Her talk, as is her book, was based unusually on a number of recorded Q and A (video) 'interviews' with eminent scientists, all of whom were also practising Christians. In between each of these, Dr Bancewicz allowed time for discussion and questions.

Professor Stephen Freeland is an astrobiologist and Director of Interdisciplinary studies at the University of Maryland in Baltimore. Stephen's research interests focus on the evolution of the amino-acid 'alphabet' – the set of 20 amino-acids with which organisms build their genetically encoded proteins. These amino-acids and others have been detected in meteorites and demonstrate a link between biology and the non-living cosmos. This raises the question of how and why life developed on our planet and what, if anything, we might expect from an independent origin of life elsewhere in a life-friendly universe.

Dr Bancewicz referred to the 'translation table' in which DNA specifically codes for the production of proteins, an incredibly clever and highly optimised process used by every living creature on earth for the past 3 billion years or so, and a source of great wonder for her. The 'cleverness' extends to allowing the odd 'mistake' from time to time! Current theory is that 'life' commenced with several generations of stars creating all the elements of the Periodic Table. Stars explode leaving behind clouds of dust (supernovae), containing inter alia amino acids, some of which made their way to earth and started life about 200,000 years after the formation of our planet. The above special coding works on earth but might there be a similar one operating elsewhere in the universe? In the interview, Professor Freeland talked about the relation of science to the cosmos and posed the question 'are we a cosmic accident in a life-friendly universe?', and suggested that there is quite likely to be independent 'life' elsewhere. Organic molecules are 'out there' in the universe and water is quite plentiful. Ruth summarised Dr Freeland's views in a slide as:

- life is an inevitable result of the life-friendly nature of the universe
- some properties of the genetic code can be predicted
- if life arose again it might have a very similar genetic code
- current scientific data is compatible with the existence of a creator God
- RNA probably came first - a flexible molecule that can act like an enzyme
- SF's own experience is of a God of surprises
- 'God is truth and truth is God'

In the Q/A time questions were asked such as 'is the genetic code still evolving? - 'yes, and the best (optimised) codes are the ones likely to survive', 'are we the first 'life forms' and is there 'life' elsewhere in the universe?' - 'who knows'!

Dr Rhoda Hawkins works as a biophysicist and Senior Lecturer in the Department of Physics and Astronomy at Leeds University. Her research interests centre on the use of theoretical physics to elucidate biological problems including cell movement and the cytoskeleton. The cytoskeleton is a biopolymer network of filamentous proteins which is constantly active, with sub-units being moved along the skeleton and being attached and detached continuously, and which forms the backbone of cells. Movement within the cell is caused by water molecules apparently randomly 'pushing around' larger particles but nevertheless still forming a beautiful pattern, from which order emerges. Summarising Dr Hawkins' 'interview':

- some people think that randomness leads only to non-predictability, lack of meaning and purpose in life, and chance occurrences, but Dr Hawkins does not subscribe to that view
- current thinking is that the random movement of molecules in a cell (ie where there is an equal probability of movement in any direction) is an essential part of cellular development
- one can predict the 'general outcome' of random events, for example if the air molecules in a room move faster (randomly) then the air temperature **will** rise
- God can/could use random processes for His creative purposes

'Could AI be part of God's creation/' - 'yes'. RH's belief in God was one of the factors that led her to study science and to see 'wonder' both in the laboratory and in His creation. Dr Hawkins is a member of the CIS committee and attends St Timothy's church.

The latter two 'interviewees' were both surprisingly positive and hopeful with regard to the future of the planet.

Dr Jeff Schloss is both a scientist (an evolutionary biologist) and a philosopher being both Professor of Biology and Director of the Centre for Faith Ethics and Life Sciences at Westmont College, Santa Barbara. Outside biology, his interests lie in the relationships between biology and Christian faith, theological and philosophical implications of evolutionary theory and the evolution of altruism and moral systems, such as the capacity to 'care'. Professor Schloss is particularly interested in the concept of 'cooperation' - 'things working together' - both at the cellular level and within and between species. To illustrate the point, Ruth showed slides of a frog carrying tiny babies on its back ('the snuggle for existence'), of algae living within a fungus (lichen), of slime mould - a single cell organism where cells can aggregate together to form 'blobs' and multicellular reproductive structures, sometimes like flowering 'stalks' - and penguins working together in a 'huddle'. Dr Bancewicz summarised her interview with Professor Schloss with the following points:

- evolutionary theory didn't pose any real challenge to his faith
- he objected to the philosophical, nihilistic view of the world that saw only competition, selfishness, warfare and a lack of purpose to life, which was a challenge to his faith
- he proposed as an alternative hypothesis the 'goodness' of the natural world

- he had come to think that the notion of love was the ultimate purpose of creation
- there is evidence that the world was a good place but one that was not yet perfect

Does the latter point imply a 'direction of travel' for the world? - Ruth felt that the trajectory was to a world of increasing complexity.

Dr Margaret Miller is a marine ecologist with her prime interest in the reproduction and preservation of coral reefs. She has recently become Research Director of SECORE an international non-profit organisation devoted to the restoration and conservation of corals mainly in the Caribbean. Ruth Bancewicz showed a slide of coral by way of introduction to her video interview commenting that the existence of coral reefs was becoming more and more critical due to the rising temperature of the oceans and the increasing concentrations of carbon dioxide (causing increased acidity). The oceans are also extremely important as a source of food for mankind. Dr Miller's thoughts were that

- Creation has intrinsic value in and of itself
- working with corals can be very discouraging because of the effects of global warming
- she believes that God allows us to work in partnership with Him
- her faith gives hope that God is in ultimate control of the world and has a plan for creation
- despite the problems the world faces Margaret is hopeful for the future

Dr Miller is active in the Biscayne Presbyterian Church in Miami.

In summary Ruth Bancewicz said that the four eminent scientists she had 'interviewed' were all people of faith and were exploring the big questions of life that their work raised. They were looking for scientific answers through science but also for theological answers through a study of theology. For further thoughts on science and faith issues, Ruth recommended the website 'scienceandbelief.org' where other Christian scientists talk about the wonder and awe that they experience through their scientific research and about how science enhances their faith.

Following further discussion David Perry thanked Ruth for her enthusiastic and wide-ranging 'excursion around science', which had substantially enhanced our feeling of wonder concerning the world we inhabit.

The next CIS meeting dealing with Science and Faith issues will be on June 12th 2018 at St Peter's Church, Farnborough where Professor Meric Srokosv's subject will be '**The Day after Tomorrow',** *The Oceans and Climate Change***.**

John Wood