Prof Colin Blakemore: Brain Size Matters

By Henry Nguyen Ngoc Huy

Size does matter. Speaking at the “Neuroscience and Society” public lecture organised by Psychology Division and the School of Biological Sciences at the HSS Auditorium on 2 October, renowned British neurobiologist Prof Colin Blakemore attributed Man’s rapid advancement in knowledge and behaviour to a sudden and remarkable 30% increase in brain size, an event that happened some 200,000 years ago.

Prof Blakemore, who was in Singapore as part of the World Cultural Council Awards (WCCA) Ceremony 2013 held at NTU, is Vice President of the World Cultural Council, Professor of Neuroscience and Philosophy in the School of Advanced Study, University of London, and Emeritus Professor of Neuroscience at the University of Oxford.

One of the world’s foremost authorities in vision, early development of the brain, neurodegenerative disease and the plasticity of the cerebral cortex, Prof Blakemore provided plenty of food for thought as he shared his understanding of the human condition with the audience.

“Brain research represents a huge challenge to science due to the complexity of the brain, but it seeks to answer the fundamental question of what it is to be human”, said Prof Blakemore.

Believing that neuroscience can explain how humans react with each other and form societies, Prof Blakemore began the lecture by examining the idea that the human brain got bigger by accident and not through evolution. Although many scientists believe humans became intelligent through evolution, Prof Blakemore’s examination of why the Homo sapiens brain was so big compared to the brains of our predecessors, the Homo erectus, suggests otherwise.

“There had been a gradual increase in brain size until 200,000 years ago, and then, there was a remarkable increase of 30% or so,” stated Prof Blakemore. “Human behaviour has changed over 200,000 years, and then [there was] a dramatic increase in the exchange of knowledge in a few hundred years.” Correlating the human’s ability to change the world with the brain’s large size, Prof
Blakemore pointed out that natural selection cannot explain the sudden dramatic 30% increase in brain size and knowledge, asserting that a spontaneous mutation in the brain is the only logical explanation for the fact that Homo erectus was transformed into super-intelligent modern man.

Prof Blakemore also stated that the brain is not intelligently designed, but is redesigned or re-engineered by individual experiences, illustrating his point with an example of how rooks (a type of crow) learn to adapt to environmental conditions.

“In ‘The Crow and the Pitcher’, a clever crow uses stones to raise the water level in a pitcher and quench its thirst”, he said, using Aesop’s well-known fable to preface a similar scientific work published by Christopher David Bird and Nathan John Emery in 2009. Bird and Emery studied how rooks used stones to raise water level to reach a floating worm, and then recorded their behavioural patterns.

“At the start, the rooks choose an equal number of small and large stones. But after that they only choose large stones. Animals with small brains can do a repertoire of things”, he added.

Asserting that “the brain can grow with inputs”, he emphasised that “big brains are clever brains but not without knowledge and experience”.

Maintaining that “an experience of a person changes as a result of what happens inside the brain, not outside”, he also examined the notion of consciousness and what areas of the brain are utilised when exposed to stimuli.

“Some regions [of the brain] are more strongly activated by faces, some are more activated by objects”, said Prof Blakemore.

He explained how this assertion could be proven by showing the Rubin vase-face illusion (which displays two different patterns of faces and objects using the same contours) to a person and using FMRI (Functional Magnetic Resonance Imaging) to track which areas of the person’s brain was showing activity.
Prof Blakemore also recounted how neuroscience has marched into many aspects of our lives like law, marketing, social neuroscience, and other areas.

“One of the most dynamic areas [in brain research] is social neuroscience. Our interaction is a dialogue of brains, a brain being changed by other people’s behaviours,” added Prof Blakemore.

Rounding up his lecture, Prof Blakemore left his audience with one last intriguing idea: “If we look at a particular pattern, and we stimulate the pattern, can we then produce an imaginary experience?” he asked.

“In principle it is possible.”