

**Chancellor, I have the honour to present, for the award of the degree of doctor of science, honoris causa, George Francis Rayner Ellis**

George Ellis has done a lot of thinking about the universe. He is, in his words, “ a scientist by profession, specializing in general relativity theory (that is, Einstein’s theory of gravity) and its applications to cosmology---the study of the origin and evolution of the universe”.<sup>1</sup> In the early 1970s, not many years out of the UCT 1960 physics honours class, he and a fellow Cambridge scientist published their first book: *The Large Scale Structure of Space Time*. Reprinted several times and translated into Chinese and Russian it had been cited over 4900 times. His co-author, Stephen Hawking was just warming up for his work on Black Holes whilst George Ellis was on the threshold of a no less distinguished career which has spanned cosmology to the complexity of the human brain with not a little social science, theology and politics in between.

Born in Johannesburg, at school in KwaZulu-Natal, George Ellis came to UCT to study architecture but moved to science after one year. He did a lot else besides including learning to fly, to fence and to row in which three activities he represented the University. He was also a member of the mountain club and a keen photographer. From Cape Town to Cambridge where he got his Ph.D. in applied maths and theoretical physics in record time before becoming, in due course, university lecturer which position he held until he returned in 1974 as full Professor at UCT where he has been based since, becoming eventually the Distinguished Professor of Complex Systems.

He has been a visiting professor at the Enrico Fermi Institute at the University of Chicago, and at other universities including Hamburg, Boston, Alberta, Austin Texas and London. He has been many times as Visitor to the Max Planck Institute for Astrophysics in Munich and for five years (1988-1993) took time off from UCT to be Full Professor of Cosmic Physics at the International School of Advanced Studies in Trieste.<sup>2</sup> The main writing in his chosen field has included three key (co-authored) books<sup>3</sup>

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<sup>1</sup> Statement by G.F.R.Ellis, Templeton Prize News Conference, March 17, 2004.

<sup>2</sup> Along the way he was elected a Fellow of the Royal Society, President of the International Society for General Relativity and Gravitation and many other honours.

<sup>3</sup> Co-authored, respectively, with Stephen Hawking, Ruth Williams and Peter Coles:

- The Large Scale Structure of Space Time<sup>4</sup>
- Flat and Curved Space-Times<sup>5</sup>
- Is the Universe Open or Closed ? The Density of Matter in the Universe.<sup>6</sup>

This last book was controversial but characteristic of Ellis in that it combined high-powered theoretical thinking with an absolute insistence on fidelity to the empirical evidence. A dozen years later the consensus of cosmologists is that Ellis & Coles were right in their estimate of the density of known matter but they did not foresee the subsequent comeback of Dark energy whose nature remains a mystery.<sup>7</sup>

George Ellis is also a Quaker constantly asking questions about the relationship between scientific understanding and religious faith. It is in this context that some of this most original thinking has been done for which he was awarded the Templeton Prize in 2004. There are four books to be noted<sup>8</sup> but the essence of his argument is that science has limits, that personal choice is real, that true morality “must be kenotic in nature, that...it must be a kind of ethics involving letting go of one’s own interest on behalf of others.” As a ‘moral realist’ he points to the fact that ethics, in the form of self-sacrificing love can be causally effective and points to the Mandela-Tutu leadership in confounding “the calculus of rationality”. One has to balance, says Ellis, the rationality of evidence-based science with faith and hope.

One might think that somebody in his ivory, ivy-covered, tower at the top of the UCT Maths Building writing these mind-bending books and articles would not have had the time or the interest to get involved in the more mundane matters of the society around them. How wrong could one be for George Ellis, ever since he returned from Cambridge 35 years ago, has used his razor sharp mind to probe social problems including homelessness, the nature of

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<sup>4</sup> CUP, 1973

<sup>5</sup> OUP, 1988

<sup>6</sup> CUP, 1997

<sup>7</sup> Two further books in the same field, which he has co-edited with others, are:

- The Renaissance of General Relativity and Cosmology, CUP, 1993
- The dynamical systems approach to cosmology, CUP, 1996

<sup>8</sup> The four books are:

- Before the Beginning, 1993
- The Moral Nature of the Universe: Cosmology, Theology & Ethics (w. Nancey Murphy), 1996
- The Far Future Universe (co-edited), 2002
- Downward Causation and the Neurobiology of Free Will(co-edited), 2009

poverty, low income housing policy, revisions in the school syllabus (especially for mathematics) , science research policy and proposals for a peace education curriculum.<sup>9</sup> In order to make some contribution to what he saw emerging as a fundamental problem in South Africa he even enrolled in 1982---full professor as he was--- for the B.Com. Honours Course in Business Administration. Not only did he get the class medal but he went on, with others, to help push for the establishment of PDOM, UCT's important Post-graduate Diploma in Organisation & Management.

But perhaps his most notable intervention was contained in articles which many people thought too hot to handle. This required not only the cool brain of an evidence-based cosmologist but also great courage. In 1992 the Western Cape Region of the SAIRR issued a regional topic paper, **Third Force: The Weight of Evidence**, in which George Ellis challenged not only the Government of President De Klerk but also fellow, liberal, members of the Institute who denied that a third force had had a major role in the alarming spread of violence in the country.<sup>10</sup> In writing of the history of this period Gerald Shaw reports that "It was not until the Goldstone Commission's fourth interim report in December 1993, that Ellis was vindicated and the judge ultimately concluded that the fact that hit-squads are operating in South Africa could no longer be seriously doubted."<sup>11</sup>

We are mercifully long past that terrible time and George Ellis has been able to turn his mind to other things. His current work, as always on the cutting edge of our understanding, is focused on the nature of causation in complex systems and on biology and mechanisms related to the dawn of language where much of the evidence, about 'homo symbolicus', is here in South Africa.<sup>12</sup>

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<sup>9</sup> The following publications are examples:

- Squatters of the Western Cape (co-authored), 1976
- Multiple causes of Poverty...w. Dot Erlank, 1983
- Low Income Housing Policy in South Africa (w. David Dewar), 1989...check date
- School Syllabus Revision: An Alternative Approach, 1991
- The School Mathematics Syllabus, 1993
- Science Research Policy in South Africa, 1994
- Peace Education Curriculum: Some Proposals, 1995

<sup>10</sup> . For the next few years George Ellis was embroiled in a very public, often very lonely, battle in which not even the Goldstone Commission could find evidence of any such 'Third Force' at work in the country.

<sup>11</sup> Gerald Shaw, Believe in Miracles: South Africa from Malan to Mandela—and the Mbeki era, A Reporter's Story, Newlands, 2007,p.103

<sup>12</sup> His chapter for a forthcoming book,"Homo Symbolicus' and the dawn of language, edited by Chris Henshilwood of the Blombos Cave and others, will be part of that fascinating exploration to understand how Homo Sapiens evolved, quite possibly in South Africa, from the Hominids which were first found here.

**Chancellor, I have the honour to invite you to admit to the degree of Doctor of Science, honoris causa, George Francis Rayner Ellis.**