Who wants to live forever?

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The Dream of Eternal Life

by Mark Benecke

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Many people dream of being immortal; many authors of popular science books have explored this intriguing subject. The latest offering is *The Dream of Eternal Life* by forensic entomologist Mark Benecke. It is a good read for the scientist and non-scientist alike. Benecke's fluent, narrative style carries the reader through the five chapters of the book, covering a wide range of subjects along the way.

The book provides several novel angles on the various aspects of ageing. Benecke describes the underlying complex biology in a well-presented manner for the general reader and balances this with other associated parameters ranging from nutrition to science-fiction. However, the book lacks the required focus that would have been provided by an author more experienced in the already complex field of ageing. The first chapter introduces the reader to the very basics of molecular and cellular biology, beginning with the pioneering experiments by Stanley Miller

in the 1950s in which he made amino acids in a test tube. The chapter continues with aspects of cell and tissue specificity, the genetic code and the role of genes, and then moves on to issues more directly related to ageing itself, such as the characteristics of growing mammalian cells *in vitro*, the description of some *Caenorhabditis elegans* genes related to ageing, the role of ApoE in human ageing and longevity and the case of *Hydra*, which, according to the author, is an immortal creature—although I can think of several respected biogerontologists who do not agree. After this somewhat exhaustive tour, Benecke finally switches gear by describing the various advantages of sexual reproduction.

Moving on to the next chapter, the author mixes a cocktail of 'after death experiences' and cases of body from soul separation, through to mummies and the legends of Count Dracula and vampires. He also presents a 'life table', which the reader can use to take a break from reading by estimating his or her 'real age'. The chapter ends with the description of various parameters that either positively or negatively influence ageing and longevity, such as exercise, energy intake, the role of the immune system, nutrition aspects—including the 'French paradox' of the benefits of drinking red wine—melatonin, biorhythms and the secrets of healthy centenarians.

Chapter three first addresses the issue of defining when a person is dead, before exploring neoteny and progeria syndromes, gene therapy aspects, Dolly the sheep and animal cloning—including whether it is feasible for dinosaurs to be resurrected—and the future possibility of brain (and cell) transplantation. In the next chapter, several ecological aspects are examined in terms of their effects on human life itself. J. Lovelock's 'Gaia hypothesis' is nicely presented, followed by the consequences of overpopulation of the earth, nutrition problems and the possibility of the future migration of humanity into space.

The final chapter then enthusiastically forecasts that decoding the human genome will help in the discovery of the genes that cause ageing in humans. This naive, in my opinion, notion—'the genes that cause ageing'—is present throughout the book. For example, at the beginning, Benecke writes that 'If one were able to cut out the undesired instructions for ageing from the corresponding strand of DNA, one might become immortal', and there are similar statements elsewhere. Benecke continues by suggesting that the isolation of such genes will be facilitated further by the direct comparison of sequences of human DNA with those of *C. elegans* that are known to encode age-related genes. This is the weakest point of the book for several reasons. Humans are more complex than these lower eukaryotes; in addition, there is also growing evidence that ageing is more a stochastic rather than a finely regulated genetically predetermined process for the very simple reason that there is no evolutionary pressure for the selection of genes that cause ageing. However, I could not agree more with the author when he states in the final pages of the book: 'It remains uncertain whether immortality is a possible development of human history. According to our current understanding of biology, it would hardly be imaginable that such a development could bring any adaptational advantage [...] if there was no such thing as death, evolution would come to a standstill. Immortality would mean the final death of the species.' In summary, the book provides the general reader with a 'good taste' of the various aspects that may (or may not) influence human life and death. Those particularly interested in the ageing field should, however, go on to read a more focused book written by an expert.

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