

## Book Reviews

Tom Marsh

**The Living End: The Future of Death, Aging and Immortality** by Guy Brown (Macmillan, 2008)

**Deadly Companions: How Microbes Shaped Our History** by Dorothy H. Crawford (Oxford University Press, 2007)

**Your Inner Fish** by Neil Shubin (Allen Lane, 2008)

The stark statistics are overwhelming. Every day, 100,000 people die of the attendant diseases of old age: the 'silent Tsunami'. A female born in Britain in 2001 can expect to live for over 80 years; chillingly, she can expect to spend more than eleven of those years struggling with ill health. There has been a shift in our received understanding of mortality. Death in the western world has been co-opted by the aged, relieving the rest of us of the painful responsibility of dying in our prime. The elderly infirm have always been isolated – there are difficulties in combining chronic illness with full engagement with the world. The relative scarcity of the aged, however, has allowed society to divert its attention to problems with fewer wrinkles. As the numerical influence of the elderly grows, so does the political imperative to face up to the problem. Alzheimer's disease alone is estimated to cost the U.S.A. \$100 billion annually. The demographic bulge of the baby-boomer generation is keeping economic predictions sunny for the manufacturers of Zimmer frames – and sepulchral for NHS finances.

*The Living End* gives a balanced overview of current scientific understanding of aging, death and all points in-between. Dr Brown's work on cellular degeneration at Cambridge University catalyses his ideas. The concept of apoptosis - programmed cell death – is clearly

and enthusiastically explained. Brown is a purposeful guide to progress in his own field; he is equally convincing several orders of magnitude away from the cellular level. It has been proposed by evolutionary biologists that sepsis, and the sudden precipitous organ failure and death that follows, may be a protective adaptive behaviour to shield close genetic relations from contact with the causative bacteria. This adaptation of the principle of programmed death prompts a fascinating discussion on the value and purpose of death. More speculatively, some gerontologists predict that the challenge of divorcing aging from irreversible physical decline is being broken down into a series of eminently soluble technical difficulties. Life expectancy increased by two years in every decade of the last century: are we close to achieving a terminal velocity that will leave time's winged chariot in the rear-view mirror?

Brown approaches such topics with a sceptical but open-minded attitude. His thesis that death and life are not a digital 'on-off' duality, but instead an analogue process, underpins his interpretations. The book deserves a broad readership: his wide-ranging exploration of the arguments is provocative, and he includes enlightening interludes from literature and philosophy. The style is discursive, witty and throws up such charming images as the "delicately neurotic" neuron which drops dead at the merest hint of stress. He even proposes a list of remedies to humanity's tussle with the fearful prospect and gruesome realities of slow, degenerative death. *The Living End*, it turns out, is a self-help manual that this reputable medical journal can whole-heartedly recommend.

The shadow of death looms omnipresent in this next selection. Professor Crawford, of Edinburgh University, has written *Deadly Companions*, a popular history of the interaction between large multi-cellular

organisms (us) and our hardy microscopic adversaries (them). Microbes prove to be as diverse and ingenious as the most fiendish military strategists, and the metaphors of battle are repeatedly deployed. Crawford opens her dispatches with a profile of a new assailant, SARS. She gives a sound account of this novel threat to our complacent well-being. Emphasis is made on speed of progress: our understanding of these emergent pathogens has been accelerated by genome sequencing and rapid-fire epidemiology, but this is matched by the lightning spread of the diseases in a mobile, jet-propelled society. Poverty, prejudice and ignorance are paraded as efficient adjutants to the microbes. Crawford's discussion on the current situation in Africa as regards HIV and malaria re-affirms this political dimension of disease. The successes of scientific medicine, and the frequent reversals of fortune, make for an intriguing balance of power. This is no-nonsense stuff, written with a persuasive, didactic rhythm and it succeeds admirably as an up-to-date primer for the interested bacterial host.

This morbid cycle of reviews concludes with a dead fish. *Your Inner Fish* begins with the tortuous tale of a recent addition to the fossil record. Neil Shubin and his team searched for years in an unenviable location, one thousand miles from the North Pole. The reward – a fish called Tiktaalik, whose protuberances are classified somewhere between fins and limbs – was unearthed in 2004 in the Nunavut Territory of northern Canada. Its remains allowed Shubin to harden a hypothesis about phylogeny. The theory says: fish and mammals share a vertebrate ancestor – a falsifiable proposition. 375 million years after perishing in a muddy stream, Tiktaalik's fossilised imprint gave it a cheery thumbs-up.

To appreciate that evolution is the predominant theory to explain the diversity and complexity of life is to live in the current intellectual

climate; to read a masterful distillation of the arguments that support the theory is rare, and of real value. Shubin's professional pedigree as expeditionary palaeontologist and anatomist is complemented by a talent for explanation and a colloquial exuberance. This book revitalises the story of the slowly accreted evidence, from Darwin onwards. It provides repeated epiphanies on the interconnectedness of living things. For instance, evolutionary history has deepened our understanding of the vagaries and redundancies of the human body. The maddening routing of cranial nerves, the undignified hiccup and the special senses are illuminated, and given wonderful relevance. To learn that 3% of the human genome is devoted to odour detection is startling. To read of the conservation of initiator gene sequences for the ear that are shared, more or less, by professors and jellyfish, is flatly astounding. A reasonable response might be that jellyfish don't even have ears. Fair point – but our enigmatic genetic lineage trumps such quibbles. Evolutionary debate in America and beyond has been poisoned by overcooked rhetoric and dogma. *Your Inner Fish* is a fine riposte to the obfuscation brigade, and can be ranked alongside the lucid essays of Steven Jay Gould and the writing of Richard Dawkins.