

BOOKS & ARTS

Future perfect?

Dizzying advances predicted for the next century could improve the world — or lead to disaster.

The Meaning of the 21st Century: A Vital Blueprint for Ensuring Our Future

by James Martin

Riverhead: 2006. 410 pp. \$26.95.

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Norman Myers

The past 50 years have probably seen more change than the previous 500 years, and those 500 witnessed more advances than the previous 5,000. The current century will surely surpass the lot, with an onrush of scientific, technological, economic, social and political change, all of a character and on a scale way beyond anything we have experienced to date. The future will not be an extension of the past, but will mark a departure from much of our activities since the start of civilization 5,000 years ago.

We have recently had a plethora of books surveying humankind's niche on Earth — our numbers, our impacts, our advances and our setbacks. Many have examined our prospects for the future, but James Martin's *The Meaning of the 21st Century* is surely the most ambitious yet. He predicts a "grand transition" from "a planet on a self-destructive course to a planet that is intelligently managed" — the intelligence reflecting not only what we have between our ears, but the intelligence of super-sophisticated computers.

To illustrate his theme, Martin deals with familiar topics such as population growth, economic advance, poverty, globalism, energy, endocrine disruptors, pandemic diseases, eco-affluence, anarchic violence, terrorism and environmental ruin. He also considers issues that have received less attention, such as hydroponics, pebble-bed nuclear reactors and electronic extensions to brains, which could lead to a huge leap in human evolution.

He analyses research breakthroughs such as biotechnology and nanotechnology, along with newcomers such as regenerative medicine, extreme-bandwidth networks, and intense forms of computerized intelligence. He asserts that "computers will become 'intelligent' in a manner quite different from human intelligence. That intelligence will feed on itself, becoming more intelligent at a rapidly accelerating rate, until there is a chain reaction of computer intelligence, which we term the Singularity" — a theme that is explored in Ray



A growing problem: the economic rise of China is likely to increase its prodigious appetite for fossil fuels.

Kurzweil's recent book, *The Singularity is Near* (see *Nature* 440, 421; 2006). Martin is so optimistic about this that he thinks future research developments could prove to be far more significant than those of the Renaissance or the Enlightenment.

In order to attain a comprehensive understanding of the challenges ahead of us, Martin has donated US\$100 million to the University of Oxford, UK, to fund a new school with goals and agendas that are effectively set out in this book. Its overriding purpose will be "to identify and find solutions to the biggest challenges facing humanity in the 21st century, and to find the biggest opportunities".

The book treats many of the topics listed above, plus dozens of others, in sufficient detail to be comprehensible to the non-expert reader. All are presented as key components of the "high-culture civilizations" and "magnificent lifestyles" that Martin foresees for this century — provided humankind chooses to stay around for long enough. He agrees with Martin Rees, president of the Royal Society in London, that humankind probably has only a 50/50 chance of surviving the century: we have the capacity for unimaginable human advancement, but if we fail to address the key issues we might face disruption that could set us back by centuries — or even eliminate

us altogether. As Martin puts it, the present century is "crunch time".

Early in the book, Martin identifies a number of major trends that have unstoppable momentum, like a freight train but on a giant scale. Among such trends are population growth, tropical deforestation, fisheries decline, mass extinction of species, climate change, and others that will be readily recognizable to readers of *Nature*. Plenty of experts know how to make the train go faster, but not enough are concerned with where it is heading, or whether we want to go there anyway. Occasionally a momentum trend is brought to a sudden halt, and the result seems to come as a surprise. For decades we poured pollutants into the atmosphere, and as long as biotas seemed to have no trouble absorbing them, no one bothered to ask whether there could be any long-term repercussions. Eventually the buffering capacity of biotas suffered a critical loading of pollutants, and we professed to be surprised by the resulting acid rain. Many such surprise events, known as discontinuities, surely lie ahead, and our scientific skills in anticipating them are meagre at best, with little research being directed at these 'unknown unknowns'. Could it be that we are programmed for denial?

Some of Martin's proposals are controversial and are likely to provoke intense debate. For

instance, he points out that many economists predict that US productivity could enjoy a long-term increase of some 2.5% per year. If extended for 100 years, this would make Americans 12 times richer in real terms than they are now. China, starting from a lower base and with a rather higher growth rate for a few decades, would be 20 times richer. Both these countries have prodigious appetites for more resources, notably fossil fuels. The world is not running out of fossil fuels yet, but it is running out of the atmospheric capacity to absorb pollutants. Will there be a radical shift in production patterns, triggering a parallel shift in consumption patterns — or the other way around? Will people have to countenance a change from 'more is better' to 'enough is best'?

A seismic transition of that order would raise all manner of questions about society and its values. "The forces of the near future are so large that they will inevitably change civilization. Human survivability (more cogent than sustainability) and creating new concepts of civilization are inextricably linked," Martin asserts.

Apocalyptic as some of Martin's writing is,

he preaches not so much 'doom and gloom' as 'doom or boom'. He sees humans "unlocking formidable new capabilities that could lead to more exciting lives and glorious civilizations" with "higher levels of happiness". Such rhetorical flourishes — there is purple prose at many places in the book — may not be to the taste of all readers, but the writing style is justified, Martin believes, by the nature of his message. He predicts an apogee of human creativity by the time of the grand transition, around the middle of the century, when humans could be standing on intellectual tiptoe to an extent never presaged until now. Indeed, it takes someone of Martin's vision to spell out such an exuberant prospect — hence the colourful phrasing to match the message. So persuasive is Martin that one can readily agree with him that, in the light of the sheer intensity of scientific research today, and of our apparent newfound capacity to solve whatever problems afflict us, the twenty-first century must surely rank as by far the finest time to be alive. ■

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this introduction, by reviewing, tagging and otherwise pointing the way to previously unheralded content.

Some of this content will be mainstream works that have fallen out of the public's gaze, or that may be better known in one corner of the world than another, perhaps leading a new reader to gleefully consume Jerome K. Jerome's 1889 bestseller *Three Men in a Boat*. But using the example of the amateur astronomers who observed Supernova 1987A, Anderson also argues that the ready availability of inexpensive technology is enabling many individuals to participate in areas that were previously restricted to professionals. Internet blogs, digital photos, audio programmes and video journals all add to the new marketplace of ideas.

The author has done substantial research and analysis, and refers to some earlier thinkers. However, in the chapter on the 'new producers', I was surprised that there was no reference to Alvin Toffler, whose concepts of the rise of amateur production and consumers-as-producers (which he termed 'prosumers') were presented several decades ago, notably in *The Third Wave* (Bantam, 1980). Also, an examination of the role of the public in the creation of the *Oxford English Dictionary* could have usefully contextualized the discussion of the 'Wikipedia phenomenon', in which many amateur contributors collaborate to produce encyclopaedic articles.

The concept of the long tail can be extended beyond the realm of entertainment. Anderson does this briefly, but still remains primarily in the Internet and software domains, looking at its applicability to the business of eBay and Google, among others.

I found it striking that this explosion in online content comes at a time when the world is experiencing substantial reductions in species diversity, and in a core aspect of culture — spoken languages. If the long tail can help to address this diversity crisis, it would certainly be invaluable for world culture. It seems to me that perhaps the Russian scientist

The road less travelled

The Long Tail: Why the Future of Business is Selling Less of More

by Chris Anderson

Hyperion: 2006. 256 pp. \$24.95

Richard Akerman

The Internet has changed from a communications tool available to a small number of academics to a worldwide medium for commerce and information. Initially, business learned how to use it from the academics, but perhaps now the research community can benefit from some of the consumer-driven developments.

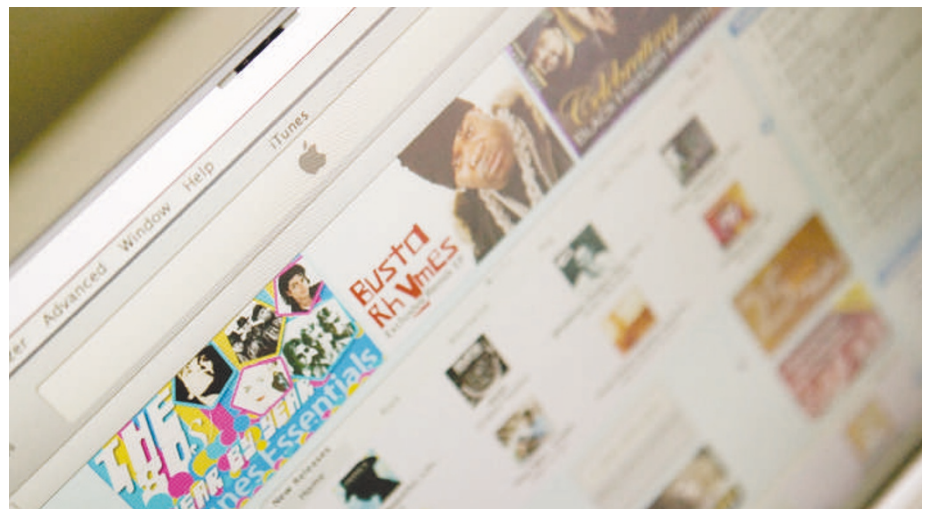
Amazon and other online retailers have discovered that there is a substantial amount of money to be made from selling a wide range of books, songs and other items that would be unprofitable or impractical to provide in physical stores, which tend to focus instead on the bestsellers. This group of less-popular content was first described by Chris Anderson as 'the long tail' in an article for *Wired* magazine in October 2004.

In his book also called *The Long Tail*, Anderson further explores the business and cultural opportunities emerging thanks to the availability and discoverability of huge amounts of entertainment and information online. He writes for and about business, and his main examples are drawn from a small number of major US Internet-centric content-distribution services including Amazon, the Rhapsody music distribution service, iTunes and the DVD rental service Netflix.

But the book also examines related Internet

developments in order to understand the multiple factors working to make the 'long tail' possible. In the electronic world, availability may be easiest of all — the cost of providing a new music track is essentially zero if a company is already storing millions of tracks. However, having provided new offerings, the company requires an audience that has somehow discovered content far beyond the heavily promoted hits they are most familiar with.

Anderson refers to this as "connecting supply and demand, introducing consumers to these new and newly available goods and driving demand down the Tail". He suggests that other consumers may be a major force in



Off the beaten track: online stores cash in by selling less-popular items as well as those by big names.