hot blood of victims and devoured livid, writhing flesh". When I asked Dart why he used such powerful prose in his serious scientific writing, he replied simply: "That will get 'em talking." And it certainly did. In my case, it provoked me to spend many years developing the new discipline of African cave taphonomy, by which the origin of such fossil assemblages may be interpreted with confidence. The result was that many of Dart's dramatic concepts gave way to more realistic ones, and the "mighty hunters" were seen to have been "the hunted". As these alternative ideas emerged, I discussed them all with Dart. To my great relief, he was delighted, saying: "This is wonderful — at last we are getting closer to the truth!" He immediately nominated me for an award.

Dart was clearly more interested in the subject than in his own position relative to it. His remarkable generosity of spirit was refreshing in the emotion-driven field of palaeoanthropology, and remains an icon for us all. As is so well portrayed in this biography, his main concern was for his fellow humans, both living and long dead. ■

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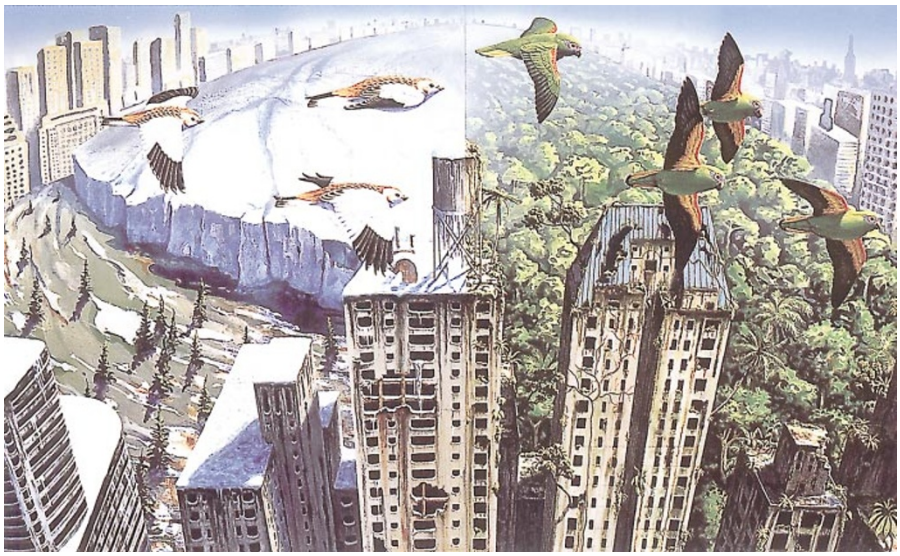
The shape of things to come

Future Evolution: An Illuminated History of Life to Come
by Peter Ward & Alexis Rockman (illustrator)
Times/Henry Holt: 2002. 208 pp. $35

Dougal Dixon

Future evolution — what an exciting prospect! Animals and plants, fundamentally changed, populating the Earth until the end of its history. Biological diversity stretching out forever. Such is the promise of this work — and with it comes the prospect of mind-expanding spectacle, and the controversy that stalks any work of futurology.

Peter Ward lays out his arguments in his introduction, summarizing them in eight points. (1) Mass extinctions in the past instigated biological innovation — I can't argue with that. (2) Past extinctions have had several causes — that's OK too. (3) The Earth has been undergoing a mass-extinction event since the end of the Ice Age — most would agree with that. (4) This mass extinction is different — well, maybe. (5) All mass extinctions have been followed by a recovery — that's fine. (6) New species will evolve — indubitably. (7) Our species, *Homo sapiens*, is extinction-proof — now that's contentious. (8) There will never be another dominant fauna — well, that depends on item (7), and is just as dubious.



Which future? Alexis Rockman's double vision reflects the unpredictability of climate.

Let's take a look at his arguments. The first third of the book details past mass extinctions. He provides dates, statistics and specific examples, but most of this is already known. It is well summarized, but is not really what we want from a book like this.

The second section is all about the current mass extinction. The 1.6 million named species today may represent a mere 3% of the total. Did you know that this is more species than existed at any time in the fossil past? It is not clear what he is using as proof, but his logic is sound: the break-up of the 'supercontinent' Pangaea led to many areas of isolation where new species could develop. Modern travel has effectively reunited Pangaea, from the biological viewpoint, and subsequent competition has eliminated many species. This, of course, along with environmental degradation, pollution and all sorts of other ills, is our fault. Again, this is familiar stuff and not really contentious. But we're interested in the future, not the past. That is why we picked up the book in the first place.

This is where Ward becomes a little more controversial. The current mass extinction, he states, is almost over. It is now 10,000 years since the end of the Ice Age, and the mass extinction has stabilized. It was never as bad as the tabloids made out anyway — however many of the 1.6 million species were wiped out, there are still a heck of a lot left. Humans will never become extinct, says Ward, and whatever evolutionary trends take place from now on will have our descendants at their core. Such anthropocentric optimism is never explained, but given that, what kind of future does he foresee?

He launches into a delightful description of "zeppelinoids" — whale-sized animals that float on internal gasbags and trail tentacles for prey. This is more like it. This is the leap of imagination that we were expecting. Alas! It is a negative example. Something that will not happen. His message in this is that there will be no new body plans. Instead, we have a world in which convergent evolution rules, a world of descendants of modern survivors — the animals that *Homo sapiens* encourages to survive by selective breeding and domestication, and the pests that will survive despite human effort. So we have a future based on the transgenic offspring of pigs, and the garbage-feeding descendants of flies, rats, raccoons and fleas.

What of mankind itself? Well-worn science-fiction themes are explored, and to some extent accepted. There is organic engineering, with industrial materials being grown rather than mined and processed. There is the fact that, through medical science, natural selection has stopped for us. The manipulation of the human genome is acknowledged, although the word 'eugenics', with all its negative overtones, is sidestepped and the moral implications ignored.

Future Evolution is well written. Each chapter begins with a personal anecdote that has some bearing and then develops into the meat of the argument. Now and again Ward climbs into H. G. Wells' time machine and jumps to a point in the future for a look around. But these trips are achingly few, and only last a couple of pages each. The final chapter, the one in which we really hope to see some Hollywood-style computer-generated imagery of the mind, begins with Ward's experiences studying the nautilus off New Caledonia (his day job) and then continues in that vein, rounding off with one of his short, tantalizing visions of the future. It leaves us with an appetite for more — much more.

We can sympathize with Ward's dilemma. He must keep his imagination on a tight rein so that the science behind his ideas is not compromised. The scientific groundwork is well laid, but the imaginative interpretation is thin. Pity! ■

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