

BOOK REVIEW

The Singularity is Near

By Ray Kurzweil

Review by Brian Wright, 2005, Penguin Press, 496 pages (plus ~100 pages of notes and a ~50-page index)

Speaking of watershed books of the life extension movement—that's the comment I made about [Engines of Creation](#), the [previous book I reviewed](#)—Ray Kurzweil's magnum opus on the imminent promise of human-life enhancement technology has arrived. Actually it arrived a couple of years ago, but it's taken me a while to get around to reading it.

Without exaggeration [The Singularity is Near](#) will likely become the preeminent futurist technology book of the 21st century. Whether Kurzweil's predictions come to pass or not, I simply cannot imagine any subsequent tome topping this one—in depth of detail, in comprehensiveness, in (trans)humanitarianism, or in elegant flow of logic. And tome it is: note I felt obligated to state in the page count above that the book has 100 pages of discursive notes... followed by a 50 page index!

Authors of technical material will tell you the size and quality of an index is directly proportional to the clarity of knowledge communicated by the author. Let's cut right to the chase. What is the Singularity?

"[It's] a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed. Although neither utopian nor dystopian, this epoch will transform the concepts that we rely on to give meaning to our lives, from our business models to the cycle of human life, including death itself." — Page 7

Early in the document, Kurzweil presents the Six Epochs of Evolution using a simple graphic shown on the right. It's really a cool summary of what he's going to demonstrate in the book, with the little spheres (representing the galaxy?) and lines representing S-curves for growth trends of new technologies. Since I doubt anyone can see the detail on the graphic, here are the epochs:

Epoch 1	Physics and Chemistry Information in atomic structures
	DNA evolves
Epoch 2	Biology Information in DNA
	Brains evolve
Epoch 3	Brains Information in neural patterns
	Technology evolves
Epoch 4	Technology Information in hardware and software designs
	Technology masters the methods of biology (including human intelligence)
Epoch 5	Merger of Technology and Human Intelligence The methods of biology (including human intelligence) are integrated into the (exponentially expanding) human technology base
	Vastly expanded human intelligence (predominantly non-biological) spreads through the universe
Epoch 6	The Universe Wakes Up Patterns of matter and energy in the universe become saturated with intelligent processes and knowledge

The Singularity basically occurs at the intersection of Epoch 4 with Epoch 5. A shorthand phrase for the Singularity is "human-machine convergence," with appropriate qualifications placed on what it means to be human and/or machine.

So roughly at the midpoint of the 21st century, individual humans en masse

will have advanced in intelligence and have improved our bodies to such an extent (through genetic- and molecular-engineering techniques) that we'll have migrated our biological consciousnesses into nonbiological forms of our own choosing... though many will no doubt opt for keeping the human form... and I'm sure most of these opters will prefer the souped-up body that doesn't succumb to arthritis, hearing loss, or ED. Can you imagine what superior physical capabilities will mean to the field of athletics?! Tiger Woods, watch out.

The more practical, more immediate effects of approaching the Singularity are radical physical/mental health improvements and the conquest of aging. (By the way, Kurzweil seems to be predicting effective immortality ~2025±5.) A lot of people are still hanging back on what would seem to be a natural desire to live vigorously, youthfully, indefinitely. Why? In [Fantastic Voyage](#) Kurzweil writes:

"Whereas some of my contemporaries may be satisfied to embrace aging gracefully as part of the cycle of life, that is not my view. It may be 'natural,' but I don't see anything positive in losing my mental agility, sensory acuity, physical limberness, sexual desire, or any other human ability. I view disease and death at any age as a calamity, as problems to overcome." — Page 210

Perhaps our philosophies and religions have had to come up with some sort of answers to aging and dying for so long, we resist letting go of the supposed necessity that invokes these answers. In the Coffee Coaster, I've visited the liberating idea of radical life extension in some of my book reviews—[Fantastic Voyage](#), [The Prospect of Immortality](#), and [Engines of Creation](#)—and and more recently in a column on cryonics. As Kurzweil states, it's a lonely battle out there on the leading edge of the "vitalist/extropist" curve:

"Being a Singularitarian has often been an alienating and lonely experience for me because most people I encounter do not share my outlook. Most "big thinkers" are totally unaware of this big thought. In a myriad of statements and comments, people typically evidence the common wisdom that human life is short, that our physical and intellectual reach is limited, and that nothing fundamental will change in our lifetimes. I expect this narrow view to change as the implications of accelerating change become increasingly apparent, but having more people with whom to share my outlook is a major reason that I wrote this book."
— Page 370

Thanks, Ray. With Singularity you've not only made more friends, you've combined a tour de force and coupe de grâce for the inspiration of rationally idealistic people everywhere. I expect one day, just as we talk about the Christian era in terms of BC and AD, we'll have another basis for gauging the centuries: BK and AK. Kurzweil does a lot of heavy lifting, systematically demonstrating the realities of the new technology, even some current concerns about environment and energy. We have reason to be optimistic. In particular, clean energy costs will drop and availability will rise:

"Today solar power costs an estimated \$2.75 per watt. Several companies are developing nanoscale solar cells.... Industry sources indicate that once solar power falls below \$1.00 per watt, it will be competitive for directly supplying electricity to the nation's power grid. Nanosolar [company] has a design based on titanium oxide nanoparticles that can be mass-produced on very thin flexible films. CEO Martin Roscheisen estimates that his technology has the potential to bring down solar-power costs to around 50 cents per watt by 2006[1], lower than that of natural gas. Competitors Nanosys and Konarka have similar projections."— Page 250

So in the lead up to the Singularity lie such important matters as cleanup of

pollution and resolution of global warming caused by fossil-fuel carbon-dioxide emissions. Not an insignificant issue, as I've also discussed in several reviews.[2]

"Of the three primary revolutions underlying the Singularity (genetics, nanotechnology, and robotics (GNR)), the most profound is R, which refers to the nonbiological intelligence that exceeds that of unenhanced humans. A more intelligent process will inherently outcompete one that is less intelligent, making intelligence the most powerful force in the universe." — Page 260

Hard to believe intelligence will someday rule the world, at least from our current vantage point here in the murky shadows of George Bush, Sean Hannity, and Bill O'Reilly. But once we purge the world of pathocracy of all varieties and achieve the vision of decentralized voluntary communities, success will become straightforward.

To describe the panorama of fundamental observations made by Mr. Kurzweil would require a substantial book in itself. He begins by justifying the principles of technological evolution and the Law of Accelerating Returns, spends two chapters describing how to achieve the computational capacity of the human brain, outlines the impact on the human body or other enhanced intelligence-carrying framework, several sections on how to best contain or thwart the perils of malevolent strong AI (artificial intelligence), and finally some deep insight-laden essays on consciousness and Singularity as Transcendence.

"...Singularitarianism is not a system of beliefs or unified viewpoints. While it is fundamentally an understanding of basic technology trends, it is simultaneously an insight that causes one to rethink everything, from the nature of health and wealth to the nature of death and self."
— Page 371

UH-OH: CHRIS MANNING COMMENTS ON THE LAST ISSUE

As we said once before, when Chris reads something, he must do it line by line. We thank him for bringing these things to our attention.

CI President's Report (page 3)

I hope rats and any other animals being used in experiments done on behalf of CI are being treated humanely. I would also hope that experiments on live animals are only being performed when there is no reasonable alternative

I am a vegetarian and I am sympathetic to the aims of the animal liberation movement, but I am *not* convinced that animal experiments are always unjustified.

A New Spirit of Preservation (page 5)

I note the reference to 'baby boomers'. I was born in 1956. I remember that the term was in use in the mid to late '60s when I was a boy in Sydney, but at that time it referred only to people born in the first five (5) years after the War. So, I was *not* a 'baby boomer' then. Now, I gather, I *am* a 'baby boomer' as the term now refers to anyone born between 1946 and 1960. (Or is it 1965?)

Ending Aging (page 7)

So the FDA does not regard ageing as a disease. I assume it regards progeria as a disease. I suggest that 'ordinary' ageing should be regarded as a disease as it differs from progeria only in degree and not in kind.

Perhaps this argument could be put to the FDA? If it is true that more lives are lost than are saved by slow FDA approval of drugs then I would have thought they should be made aware of that argument as well.

BTW this might be pedantry on my part, but it is probably better to use the word 'youthful' rather than 'young' when referring to the rejuvenation of middle-aged mice.

God Wants You Dead (page 10)

The concern about people seeing these



CHRIS MANNING

words on the cover of *Long Life* could probably have been allayed simply by making them part of a larger whole, less susceptible of misinterpretation, such as 'Book Review: God Wants You Dead.'

Yes, in retrospect, this would have been wiser.

Regarding the problem of personal identity, my own belief FWIW is that, in terms of one's sense of personal identity, revival from suspension would be no different from regaining consciousness after an operation, or even waking up in the morning.

Report from Russia (page 12)

Was Lenin expecting to be revived or is Dr Pichugin being facetious? BTW in my mind I have been pronouncing his name 'pit-CHEW-gin' (with 'gin' as in 'begin'). I trust this is correct. *Chris-Leave out the "t"—piCHEW-gin.*

(At this point I wave back to 'Olya' who incidentally appears to be sporting a pair of Levis. I seem to remember reading somewhere that these are expensive and prized possessions in Russia.)

We neglected to say that Olya was a TV personality, and was part of a crew video-taping a report for Russian TV.

CIYG Digest (page 15)

Longevity Insurance

I would be getting as many predictive tests done as possible to ascertain my likelihood of reaching 85. No point in buying longevity insurance if I am going to discover next week that I have some degenerative disease. One thing the article didn't mention was, 'Assuming you make it to 85, how much longer do you need to live to get your money back?' For the example given in the article, the answer appears to be (50,000/40,800) years or about 15 months.

A Difficult Conversation What is a Tuff shed?

"TUFF" is the name of a line of outdoor storage sheds.

Bioethics and Life Extension (page 16)

The university in Baltimore where Francis Fukuyama works is Johns Hopkins (not John Hopkins). That one is a common mistake which I already knew. However, I needed to do a Google search to verify that it's the Hastings Center, based in Briarcliff Manor, NY, which studies biomedical ethics.

WHY I THINK CRYONICS HAS A REASONABLE CHANCE OF WORKING (page 17)

The type of calculation to which Marta refers is called a Fermi calculation or a back-of-the-envelope calculation. The popularization of such calculations is one of the lesser known achievements of the physicist Enrico Fermi. About con men I will have a few words to say in a separate email. To part with your money or life is to 'lose' it.

THERAPEUTIC HYPOTHERMIA (page 21)

My sister-in-law is a GP (physician) in Sydney. I will ask her whether she has used therapeutic hypothermia to treat patients after cardiac arrest.

Peter Needs Your Help (page 23)

A few years ago I read a science fiction story called 'At the Eschaton' by Charles Sheffield. I love this story dearly. It was in an anthology I borrowed from one of my local libraries. I have tried several times to find the book again, without success. The computer catalogue indicated that it was in an anthology called 'Far Futures' but when I procured the volume in question from the

shelf I found that it did not contain that story. I think there must be two books with the same name.

Immortalist Society (page 25)

I note that a gift subscription of 5 copies of *Long Life* (@ \$20 a copy) would cost \$100 but 6 copies (@ \$15 a copy) would cost only \$90.

We've changed this. See page --

Cryonics Institute (page 25)

This article alludes to something called 'The Immoralist Society'.

This one floored us! This typo started in the Nov-Dec 2001 issue, and appears to have gone on continuously since then! Good job Chris!

The Final Word (page 26)

It has to be 'the unexplainable phenomenon was (or 'phenomena were' if we are talking about more than one of them) indeed consistent with Newton's Laws.'

The address of the Immortalist Society (back cover)

As stated on page 25, the Immortalist Society is at the same premises as CI. As already pointed out by Bob (I think), it's 24355, not 24335 Sorrentino Court. (i.e. it's not next door or just down the street from CI.)

Could someone please explain to me why such high street numbers are used in the US? It isn't that everything in the US has to be big, is it? (That's just Texas.) And I have seen the Google map of the area around the CI facility, and Sorrentino Court is only a little street. Here in Australia (and I think in most other places), the numbers in a street typically go 1, 3, 5, ... on one side and 2, 4, 6, ... on the other. Many years ago I visited and stayed with a gentleman at his house in San Francisco. Its street number was 1311, but by walking along the street I worked out that if it had been numbered as in Australia, his street number would have been 79.

I believe the main reason for large street numbers in the Detroit area is the custom of starting numbers near the Detroit River and increasing at greater distances, including the suburbs. The CI street number of 24355 Sorrentino Court, and my home address of 35871 Larchwood (Larchwood is only one block long!) probably refers to the distance from the Detroit River or/and the distance from some east-west marker such as Lake St. Clair. Monumentally unimportant--Bob (Ettinger)

In the US, it is not unusual for street numbers to increment by units of 100 for each cross street, and/or to match the numeration of cross streets. i.e. 200-299 Union Street would be between 2nd and 3rd Avenue.-Ellie.

BTW Marta mentioned in her article that by 'WA' she means 'Western Australia'. Whilst on the subject of big things I will take the opportunity to mention that Western Australia is about three (3) times the size of Texas. It boasts the largest electorate constituency; congressional district in the world, that of Kalgoorlie, which covers most of the area of WA.

A note on terminology In a recent message, 'Wills and Funerals' I mentioned the 'solicitor' who did my will. I have just remembered that this word is not used in the US. I think you call them 'attorneys'. BTW today (Saturday 26 January) is Australia Day, our equivalent of July 4. It is the anniversary of the day in 1788 when Captain Arthur Phillip arrived with the first shipload of convicts from England. Greetings to Marta and any other Australians who may happen to be reading this.

I recently posted to the CI Yahoo group some comments about the Jan-Feb issue of *Long Life*. I suppose you will be printing all or some of these comments in the next issue, as you have done in the past. If it isn't already too late, I would prefer that you didn't print my comments about typos. I made one of my own! It's Francis Fukuyama, not Frances. If you do print my typo comments, I would be grateful if you could also print this correction (or print my comments with the spelling of that name corrected).--**Chris Manning**

LETTERS

Yesterday I received the first 2008 issue of long life, and was heartened by the good job John Bull and contributors are doing.

One small problem noted--the back cover has the wrong address for CI. It is shown as 24335 Sorrentino Court, but should be 24355.

Ben and York and Marta shed a lot of light, and David Center's piece was good, and Catherine Baldwin's contribution offered some information.

Aubrey de Grey suggested *Wired* magazine as venue for a Science Court type essay contest, and I have queried the editor in chief.

Dr. de Grey also asked for citations concerning Bjorksten's writings on cross linkage and soil enzymes. See "The Crosslinkage Theory of Aging," *Journal of the American Geriatric Society*, v. 23, April 1968. Also "Theories (of Aging)" in the book *Aging Life Processes*, ed. Seymour Bakerman, Charles C. Thomas publisher, 1969.--Bob (Ettinger)

Hi John Bull,

My compliments for keeping the *long life* magazine going every 2 months, reading it seldom bores me. Keep it up.

I would like to request a change for the page 'Cryonics Support Groups Worldwide' (inside back cover), for "NETHERLANDS". The chairman of the Dutch Cryonics Organization stepped down late 2007, and George Overmeire took his place as the new chairman. I became the new secretary, and George requested me to have the now outdated information in *Long Life* changed. After 6 years, the organization currently has 6 paying members (~\$500 per year each, including one student!) and we just purchased 2 Ambu cardio pumps as our first standby equipment. It's a Good Thing to see likeminded people team up and it's even better to have the listing of standby

groups in Long Life growing and growing. Our CURRENT infoline reads like this:

"NETHERLANDS: The Dutch Cryonics Organization is growing <http://www.cryonisme.nl> Contact Secretary George Overmeire at +31 (0) 70-3503914, or mobile phone +31-(0)615092301. e-mail: george@georgeovermeire.nl"

The FUTURE infoline should read like this "NETHERLANDS: The Dutch Cryonics Organization is the local standby group and welcomes new enthusiasts (<http://www.cryonisme.nl>). Contact Secretary Jappie Hoekstra at +31-(0)6-53213893 or e-mail: jh@hoekstra-media.nl"

I kept the text at the same length as the current text, so you won't run out of space already :-). Thank you!

Jappie Hoekstra

David Flude reports on a unique and also chilling medical treatment—

I have done a summary as follows:

"UK's Top Jockey, Tony McCoy is using a Kriotherapy Freezer Chamber at the exclusive Champneys Health Resort in Hertfordshire, UK to cure his multiple fractured vertebra. Clad only in Boxer shorts, Gloves, Socks & a Mask, Tony is freezing himself to fitness at Minus -145 Celsius. He stands in the bone chilling Liquid Nitrogen Chamber for 3 minutes at a time, twice a day over a period of several weeks. "It's so cold it's hard to explain, but you can feel yourself hardening!" he said." Summarized from an article in the Daily Mail of February 24th. 2008.

.Kind regards

David & May Flude

When one door closes another door opens; but we so often look so long and so regretfully upon the closed door, that we do not see the ones which open for us. – Alexander Graham Bell

