

SEX, DRIFTING AND HOT SOCCER BABES

PLAYBOY

ENTERTAINMENT

www.playboy.com • JULY 2006

20^Q
UFC'S
DANA WHITE

LA DOLCE
VIDA!
VIDA GUERRA
BARES ALL
IN A CHEEKY
PICTORIAL

HOLLYWOOD HITMAKER
JERRY
BRUCKHEIMER
INTERVIEW

PLUS:
MARGARET
ATWOOD
THE NEW HUMAN
PENN JILLETTE
BEACH FASHION
WITH MICHELLE
LOMBARDO
RAY KURZWEIL

\$5.99



0 70992 35270 8

THE NEW HUMAN

THE NEXT 20 YEARS WILL
CHANGE OUR IDEA OF WHAT
IT MEANS TO BE HUMAN

OUR SINGULAR FUTURE

Ray Kurzweil, author of *The Singularity Is Near: When Humans Transcend Biology*, was inducted in 2002 into the National Inventors Hall of Fame.

In the mid-1980s inventor Ray Kurzweil predicted that a few interconnected computers used by scientists would serve as the basis for a worldwide communications network. At the time it seemed far-fetched, but Arpanet evolved into the Internet. Kurzweil subsequently postulated the law of accelerating returns, which holds that information technology increases exponentially, doubling every year. He later predicted that computers would exceed human intelligence, eventually reaching a point—the singularity—at which civilization would fundamentally be transformed. In his new book, *The Singularity Is Near*, Kurzweil explores the implications of that change. He believes our bodies will evolve as much as our machines. In fact, he predicts a clear separation will no longer exist between the two. “If you describe what human beings enhanced with this technology will be capable of some decades hence,” Kurzweil says, “they would appear like gods to us today.”

PLAYBOY: What is the singularity?

KURZWEIL: It's a metaphor borrowed from physics, which in turn had borrowed it from mathematics. In physics it's a point of profound transformation, a rupture in space-time. There's an event horizon around it that's hard to see into. But the historical singularity is an event that will occur, in my estimation, in about 49 years. It will be a profound transformation of human civilization caused by the emergence of nonbiological intelligence billions of times more powerful than unenhanced biological intelligence.

Underlying all this is the observation that information technology grows exponentially. Bandwidth, the price-performance ratio of computers and the size of the Internet all double every year. That's true of all kinds of information. For example, the amount of DNA sequencing we're doing doubles every year. The resolution of brain scanning doubles every year.

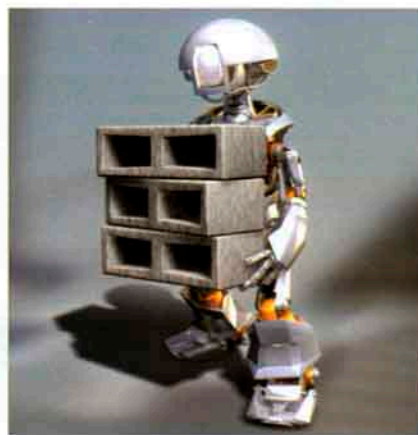
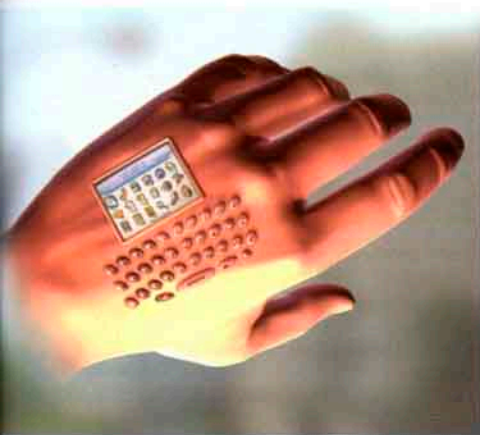


PLAYBOY: What if there's a limit to Moore's law, which says computing power doubles every 18 months?

KURZWEIL: Certain things follow predictable trends. Moore's law will reach a limit, it's estimated, in 2020. But every time we've come to the end of one paradigm, we reach another. Moore's law was the fifth paradigm. The third was vacuum tubes; the fourth was transistors. The sixth will be three-dimensional molecular circuits. One cubic inch of nanotube circuitry, for example, would be 100 million times more powerful than the human brain.

PLAYBOY: But will it be better than the human brain?

KURZWEIL: We'll take the power of human intelligence—our ability to recognize (concluded on page 134)



MIRCO ILIC

FUTURE SHOCK

“Prediction is very difficult,” said physicist Niels Bohr, “especially of the future.” But according to futurists, we are on the verge of astonishing developments. Here are four innovations we should see in the next decade.

ENHANCED EYES Some time after 2010 active contact lenses will be used to produce computer-generated overlays on what we see in the real world. “Even if your partner's physical appearance is not quite up to your hopes,” writes Ian Pearson, futurist for British Telecom, “it could be digitally enhanced with something closer to your dreams.”

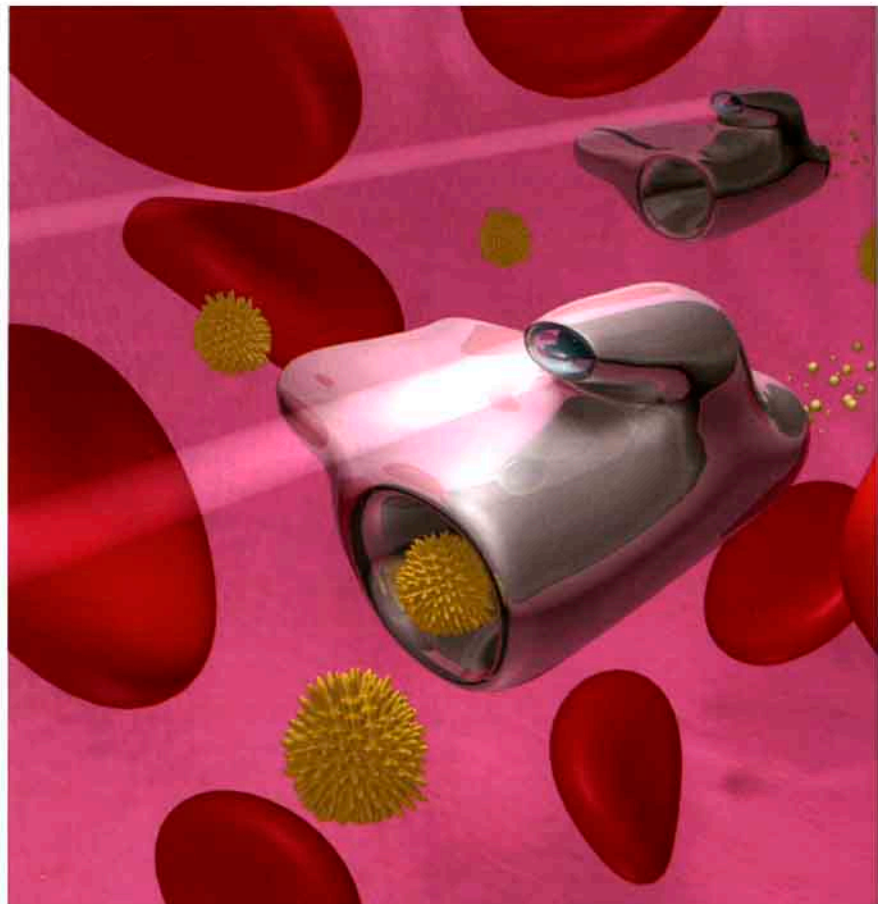
MY ROBOT By 2010 all-purpose robots should be available for common household tasks. Carmakers (Honda, Toyota) will lead the way. Hans Moravec of Carnegie Mellon predicts that by 2025 the robot market will be larger than the market for automobiles.

DIGITALIZATION OF PHYSICAL OBJECTS Not only will information be convertible to digital codes, but atoms will be as well. This process may take a few years, but it will allow three-dimensional printers to use organic inks to create logic circuits or spray down individual atoms. “An example would

be 3-D printing of organic tissue,” says futurist Jeff Harrow. “The day will come when you can replicate on a printer a new liver that won't be rejected.”

ACTIVE SKIN According to Pearson, by the end of this decade we will be able to build ID and memory chips, sensors and short-range communications devices smaller than human skin cells. These will be printed on or blasted into the upper layers of the skin and arranged into circuits so that electronic devices such as cell phones, keyboards and MP3 players can be embedded into your forearm, the back of your hand or your wrist.

Nanobots like the tiny robot pictured at right will soon be able to perform medical procedures inside the body.



KURZWEIL (continued from page 55)

People from 40 to 80, maybe a little older, can extend their longevity by hanging in there for a little longer.

patterns—and combine it with the ways machines are already superior. They can remember billions of things and share information at high speeds. So nonhuman intelligence will ultimately be able to read all human literature and learn all science and technology. Plus it will examine its own source code and redesign itself, which is something we as humans aren't able to do.

PLAYBOY: In *Singularity* you write, "Our technology will match and then exceed the refinement and suppleness of what we regard as the best of human traits." So you're not talking about just calculations per second?

KURZWEIL: Our emotional intelligence is the cutting edge of human intelligence. Humor and love are complicated behaviors. Understanding them requires a very high level of intelligence.

PLAYBOY: Are you saying love can be reduced to calculations? If you're right, how will that change the way we look at what it means to be human?

KURZWEIL: That's precisely why this is called the singularity—because it's so hard to wrap our mind around. We take for granted certain characteristics of software that are actually advantages we don't have as human beings. If you change computers, you don't throw all your files away; you just port them over to the new hardware. The information has a longevity that transcends the hardware it's on. But that's not the case with another important file, the mind. We take for granted that when our hardware crashes, the software is gone with it. There's no reason to imagine the mind can't transcend the hardware it runs on.

PLAYBOY: Is that why you say that in 25 years we'll be "more nonbiological than biological"?

KURZWEIL: Computers used to be remote; now they're in our pockets. They'll make their way into our clothing. They'll make their way into our body and brain. You can't point to a single organ for which we haven't made enhancements or started work on them. Some Parkinson's patients have an FDA-approved neural implant. The latest generation of it allows you to upload software from outside the patient. If we follow this trend—the exponential shrinking of technology—we'll be able to send intelligent nanobots the size of blood cells into our brain. Neural implants introduced noninvasively will be able to extend our intelligence or provide virtual reality by replacing the input from our senses so it feels as if we're in a different environment.

PLAYBOY: What if people don't want to become more nonbiological? What if they can't afford it?

KURZWEIL: There are always early and late adopters, but I think it's going to be a slippery slope. Some conservative applications will be about just keeping you healthy and doing routine things like expanding your memory. Very few people will eschew those enhancements. How many people won't use eyeglasses? When technology is introduced, only the wealthy can afford it and it doesn't work well. A few years go by, and it's expensive and works a bit better. Eventually it's not that expensive and works well. Not so long ago, if someone took out a mobile phone, it meant he was a member of the power elite.

PLAYBOY: And you think all this technology will radically extend human life?

KURZWEIL: In the book I wrote with Terry Grossman, *Fantastic Voyage: Live Long Enough to Live Forever*, we talk about bridges to radical life extension. Bridge one is what we can do today. I think people from 40 to 80, maybe a little older, can extend their longevity by hanging in there for a little longer. The point of bridge one is to be in good shape for 10 or 15 years, when bridge two comes along.

PLAYBOY: How do you do that?

KURZWEIL: Aging is not one thing; it's a number of processes. We have strategies for slowing down each of the dozen aging processes. The program we prescribe depends on which health issues you have. Disease doesn't come out of the blue. You can catch it. Find out where you are in certain measurements of health before you get cancer or a heart attack, a third of which are fatal.

PLAYBOY: What happens if you make it to bridge two?

KURZWEIL: Bridge two will be the mastery of our biology, being able to turn genes on and off. One of those genes, the fat-insulin receptor gene, says, "Hold on to every calorie because the next hunting season may not turn out so well." We'd like to turn that off. That technology will reach maturity in 10 to 15 years. This will bring us to the third bridge, which is nanotech, with which we can not just refine and reprogram biology but go beyond it altogether. One killer app is nanobots, blood-cell-size devices that can go inside our body and brain and keep us healthy. We have already put microscopic machines into animals. If you apply these exponential trends, which I maintain are quite predictable, we'll be able to have sophisticated computerized devices in our bloodstream, performing very sophisticated functions.

PLAYBOY: But the notion that life is limited has always been one of the principles that define what it means to be human.

KURZWEIL: I don't think we need death to give life meaning. There are different concepts of what it means to be human. My concept is different: We're a species that goes beyond our limitations. We didn't stay on the ground, we didn't stay on the planet, and we didn't stay within the limitations of our biology. Extending human longevity is not a new story. Human life expectancy was 37 in 1800. Sanitation and antibiotics brought it into the 60s and now it's in the 80s. We'll have another major jump in longevity when we reprogram our genes, turning off genes with RNA interference, turning on genes with gene therapy, turning enzymes on and off—things I believe we'll master in 15 years.

PLAYBOY: Will this make us happier?

KURZWEIL: I'm not confident we will overcome human conflict. Some people think that because I talk about this technology's problem-solving ability, it is a utopian vision. But I think we will introduce new problems along the way. Also, I don't think that just being happy is the right goal. A salamander may be happy, but its life is not very interesting compared with our life. Would you rather be a happy salamander or have a dynamic life of accomplishment and challenge? The meaningful thing in life is creating knowledge. I don't just mean random bits of data but knowledge—like art, music, poetry, literature or even our relationships and the way we express ourselves.

PLAYBOY: What will sex be like in 20 or 25 years?

KURZWEIL: These technologies will have a profound impact because sex and intimacy involve all five senses. By 2020 we'll have perfected virtual reality that can be delivered from outside the body. We'll have images written to our retinas, and we'll be able to enter a full-immersion virtual-reality environment. So you could be with someone else from a sensory perspective. You'll feel as though you're really with that person. You could take a walk on a virtual beach. The whole idea of what it means to have a sexual relationship will be different. It will certainly change the whole idea of sex workers. But what's really interesting is that we'll eventually have virtual reality from inside the nervous system. We'll have nanobots that go inside the brain, shut down signals coming from your senses and replace them with the signals your brain would be receiving if you were in a virtual environment. And you could go to this environment with one other person and have a sensual encounter involving all five senses. You could be someone else. A couple could turn themselves into each other. Ultimately it will be highly realistic and competitive with reality.

—ROBERT LEVINE