

## NOT IN OUR WILDEST DREAMS

by Leah Curtin RN PhD(h)



In 1900, no one living would have predicted what has come to be ordinary occurrences in 2006: Radio - great symphonies playing in homes throughout the world; TV - moving images and sound transmitted into the living rooms of poor and rich alike; Aircraft (thousands of them taking off and landing every hour) whisking tens of thousands of people almost anywhere on earth; People talking on tiny instruments to other people - without even wires attached; Some pills that prevent pregnancy, and others that treat killer diseases; Men walking on the moon ... Not in their wildest dreams!

Much of what has become commonplace today could not have been predicted in 1900 because common sense, as well as the prevailing scientific theories, precluded even the possibility that such things could come to be. There were a few hints: Roentgen had discovered a mysterious phenomenon he called an X-ray, and a French scientist had noted that a metallic element, uranium, fogged photographic plates without either touching them or emitting light... but surely science would soon explain them! After all, the enlightened lived by science - and by the end of the 19th Century, many believed that all that could be known already was known, although a few refinements would be made. 19th century complacency was soon to be shattered!

At the end of this year which, in many ways was not a pleasant year at all, it would be refreshing to speculate about what the future might hold for us: Not the gloom and doom stuff, but

rather the "Gee Whiz!" stuff. So, what are some of the not just possibilities, but *probabilities* - of the next 100 years? First, let's look at what already is happening, and what it's likely to lead to in the very near future:

Today we use enzymes to clear clogged arteries. In a few years ASHD treatments based on nitric acid, the active molecule in Viagra, which allows arteries to become thicker - took for the development of proteins that create small arteries when main arteries are blocked, and don't be surprised to find scientists growing bone marrow stem cells in the heart to treat scarring from heart attacks.

Despite the "Frankenfood" reaction to genetically altered food, medicines will take on a new look as researchers develop therapeutic foods. A researcher at Cornell University engineered a banana that contains a vaccine for colds and flu. At Penn State, another scientist is growing mushrooms and garlic in fortified soil to increase their store of selenium, which helps prevent prostate cancer. Researchers are hard at work investigating proteins that may be effective in treating Alzheimer's disease - and if you love steak, don't despair, we may have a cholesterol-blocking steak sauce that will let you enjoy it with impunity! Diseases like Alzheimer's and multiple sclerosis will be treated, maybe even reversed, by isolated molecules.

In addition to genetic screening for risk, targeted prevention and vaccines that help inoculate infants against some types of cancers, combined with better diagnosis and less drastic and invasive treatment, will dramatically improve cancer survival rates from today's 60% up to 85% or better. FDA currently is testing antibodies sent through the bloodstream that will flag them for destruction by the immune system - or tag them with radioactive poison. Other new world treatments will include angiogenic drugs, which will starve tumors by cutting off their blood supply.

At Yale University, some cocaine addicts have been treated with antibodies that trap cocaine molecules before they reach the brain. They are later excreted in the urine and someone has now invented a "networked potty" that will measure chemical levels in the urine and report them automatically!

In 10 years, we'll be injecting self-replicating nanobots to repair damage or treat disease from the inside out. I have only scratched the surface at this point. For example, in 10 years, 'designer drugs' will come to mean a single pill (or implantable device) containing all the drugs a patient needs embedded in time release materials

There will be injectable genetic treatments to cure ailments in unborn babies - and even in the older adult in whom the disease has already manifested itself; pills that actually will 'burn fat' with or without diet and exercise; Prostheses that will look and act so nearly like the 'real thing' that no one but your surgeon will know the difference; Anti-aging drugs that really do retard the aging process and enable healthy living through your first 10 years or so; Drugs to stimulate the growth of new brain tissue; Transplanted exogenous nerve cells to repair damaged nerves; Implanted devices to stimulate paralyzed muscles. In 100 years, we'll be rearranging

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molecules from the outside in to repair, rebuild, restore and renew damaged, diseased or worn out tissues.

Computers already can capture messages 'telepathically' and translate them into action. Attached by wires, computers magnify electronic signals from the brain and transmit commands. Soon we'll be able to eliminate the wires, and in 100 years, work will be done at the speed of thought.

What we now know is possible is stunning. Now let's move on to the 'impossible' - the realms of what most of us would consider science fiction, and physicists consider science prediction. Within 50 years we most likely will be able to teleport people (gives the whole idea of telemedicine a new twist!) - and in another 100 years it may be as common as air travel is today. In fact, 'quantum teleportation' has been accomplished already - albeit not yet with living beings, but the studies are under way.

And as for computer power: no more waiting! Transmissions will be instantaneous - and the power of the everyday computer will be more than the collective power of all the computers in the world today. Microchips will be a thing of the past because data will be transmitted molecularly. In fact, computers themselves will be so tiny they will be microscopic, perhaps mounted on your thumbnail for instant access.

And Robots - or perhaps we will call them cybernetic persons - will function as you and I (and probably look even better!). Researchers at Massachusetts's Institute of Technology's (MIT) Artificial Intelligence lab are exploring - and creating - robots that may respond and act like humans: one robot, nicknamed Kismet, has even been programmed to read human facial expressions and react "emotionally" ...if we treat them as if they were human! The real news, however, is Cog: an interactive robot that makes eye contact, plays catch and bobbles a Slinky back and forth in its hands. Cog is built with 'embodied' intelligence - every joint has an independent 'thinking' machine designed to interact in simple ways with the joints around it, and to take cues directly from its environment. Far sooner than most humans will be ready for it, MIT's scientists are going to marry (as in integrate) Kismet and Cog - and then, Data! To take this thesis a step further, MIT's AI researchers could join forces with Emory's neuro - whose work enables brain waves to be picked up, magnified and used to communicate and/or perform any function that a computer can perform. Humans actually could create their own doppelgangers.

And in far less than 100 years, integrated applications will be routinely embedded in 'smart' buildings, in decision- support environments (both clinical and managerial), in medical technology and patient monitoring - diagnosis - intervention (it's already in the O.R.). In 100 years, we won't have O.R.s -- and there will be no 'invasive' medicine. People won't come to the O.R., the O.R. will come to the people.

As for U.F.O.s - Who knows? But where myth rises, the impossible becomes probable.

And if you doubt this -- just think what might actually be the case! Chances are we wouldn't even be able to guess -- not in our wildest dreams!

Dr. Leah Curtin, well-known for her wry wit and humour, publishes *The Journal of Clinical Systems Management*, a fact-filled scan of health care in the U.S. She is a member of the adjunct faculty at the University of Cincinnati College of Nursing and is the author of more than 200 articles and 240 editorials as well as 6 books written for professionals.



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