D R. T O M O R R O W

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LESSONS FROM THE FUTURE

NANOTECHNOLOGY: BUCK ROGERS 2001

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Remember reading about the thermometer you swallow. What can top that? The real-life version of the old movie "The Incredible Voyage". A "submarine" that will course through the blood system correcting damage, removing debris and generally surveying the human structure -- from the inside -- and reporting back on unusual deviations from the norm ... the norm at that time.

Reports from Japan insist that Tokyo University has plans to develop a microscopic "submarine" designed for internal human travel. It could revolutionize medicine. Possibly such a mobile device could remain in the body more or less permanently. After all, the internal thermometer already has the capacity to remain in the body for a full year constantly reporting thermal conditions.

Can the future top this? Of course. Although traditional scientists view the "submarine" concept as far out, the powerful Ministry of Trade and Industry (MIDI) in Japan lists nanotechnology as among the most critical developments for the 21st century.

I just finished reading the 300-page kindergarten primer on the subject by K. Eric Drexler. Your five-year-old should be able to comprehend this. Nano (meaning one-billionth) technology is based on the manipulation of individual atoms or molecules to build structures to complex, atomic specifications. At the molecular level things act differently than when grouped together in much larger clumps such as in things we see in our everyday life. The "submarine" is extremely small. Not like the bulky silicon motor made recently by researchers at the University of California at Berkeley which has the thickness of a human hair and can spin at only 500 rpm. Transistors were originally about one-third the width of a human hair. Today's transisters are one-hundredth the width of a human hair. At the Mass. Institute of Technology, experimental transistors are down to 25 nanometres, about .003 the width of a human hair -- about 100 atoms wide.

It's a totally new world when things get this small. For instance, researchers at AT&T found that a cluster of 12 silicon atoms react up to 1,000 times faster than a cluster of 13 atoms. The potential is monumental. Computers in a pencil may serve as translators and robots that can see, talk and react to your commands. It is all happening fast and in so many places. Nanotechnology can probably be applied both metal and ceramic materials which could result in longer-lasting engine parts and higher efficiency in smaller power units. Improvements increase 300 to 500 percent with every new development -- not the 10 percent that was consider a big deal in the industrial age.

As Einstein said, electrons will flow like waves instead of particles.

More information: "Engines of Creation, The Coming Era of Nanotechnology", by K.

Eric Drexler; Publisher: Doubleday Anchor Press, Toronto.

Now, the world's smallest corporate logo. Thirty five individual xenon atoms have now been arranged in the familiar IBM logo by IBM physicists Don Eigler and Erhard Schweizer at IBM's Almaden Research Center in San Jose, California. They used a scanning tunneling microscope which measures distances in nanometres, and it took 22 hours to accomplish the task -- the first time.