



**Into the 3<sup>rd</sup> Dimension: Ground to  
Air to Space in the 21<sup>st</sup> Century**

**Glen Hiemstra**  
[www.futurist.com](http://www.futurist.com)

*“If you don’t go far enough back in  
memory or far enough ahead in  
hope, your present will be  
impoverished.”*

**Edward Lindaman**

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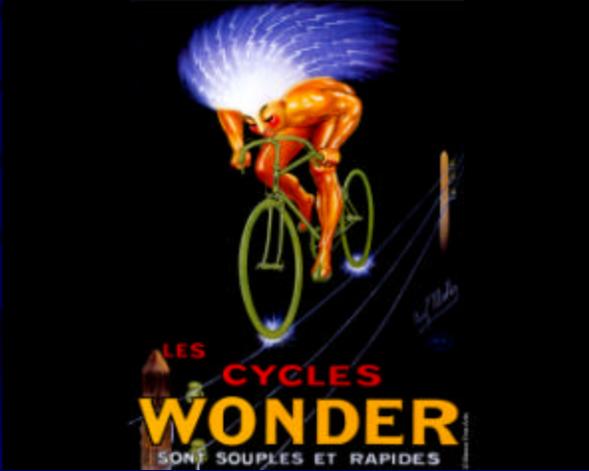
## Think in Future Tense

- *Challenge Assumptions*
- *Explore ETD's*
- *Envision*
- *Create First Wins*



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## What is Your Image of the Future of Transportation?



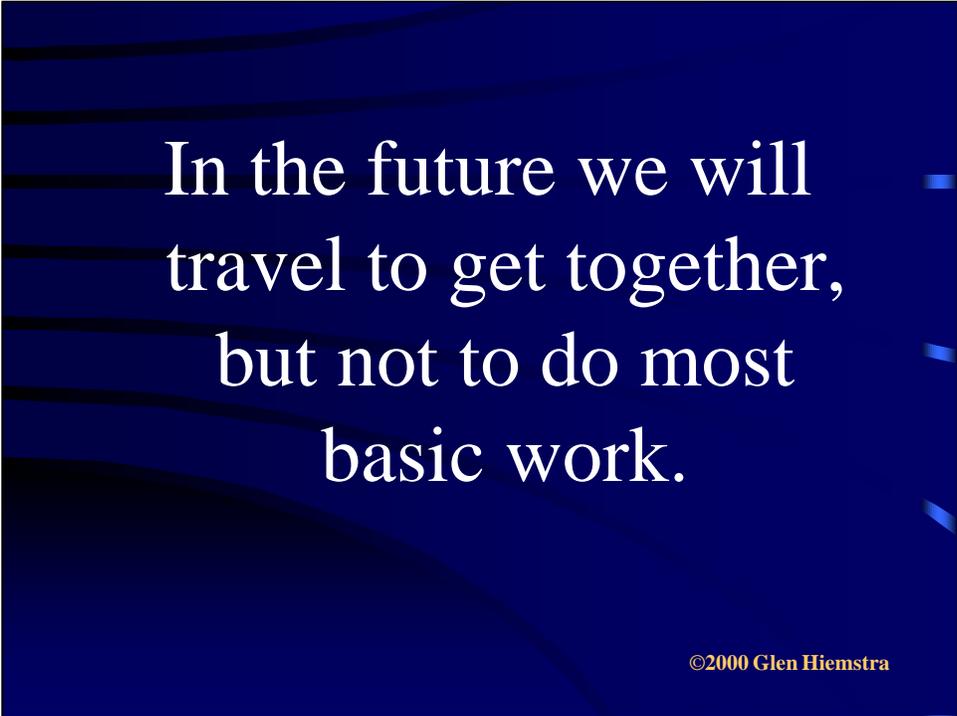
LES CYCLES WONDER  
SONT SOUPLES ET RAPIDES

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“The future enters into us  
in order to transform itself in us,  
long before it happens.”

Rainer Maria Rilke



In the future we will  
travel to get together,  
but not to do most  
basic work.

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Zero Dimension Civilization

One Dimension Civilization

Two Dimension Civilization

Three Dimension Civilization

Reference: William Knoke

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### Fourth Dimension...

Placeless society...

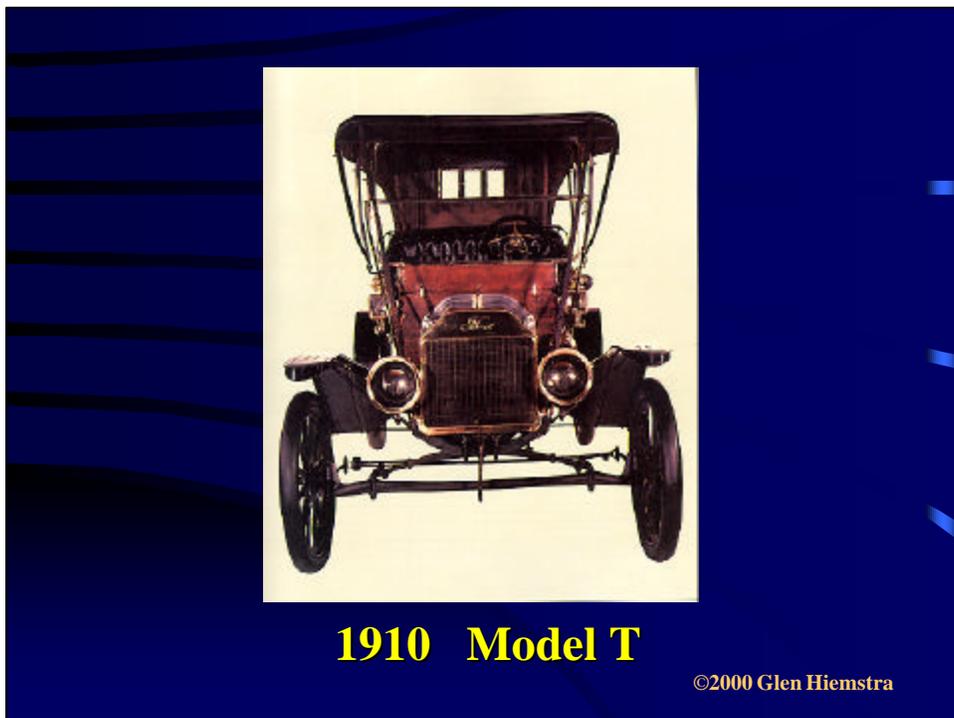
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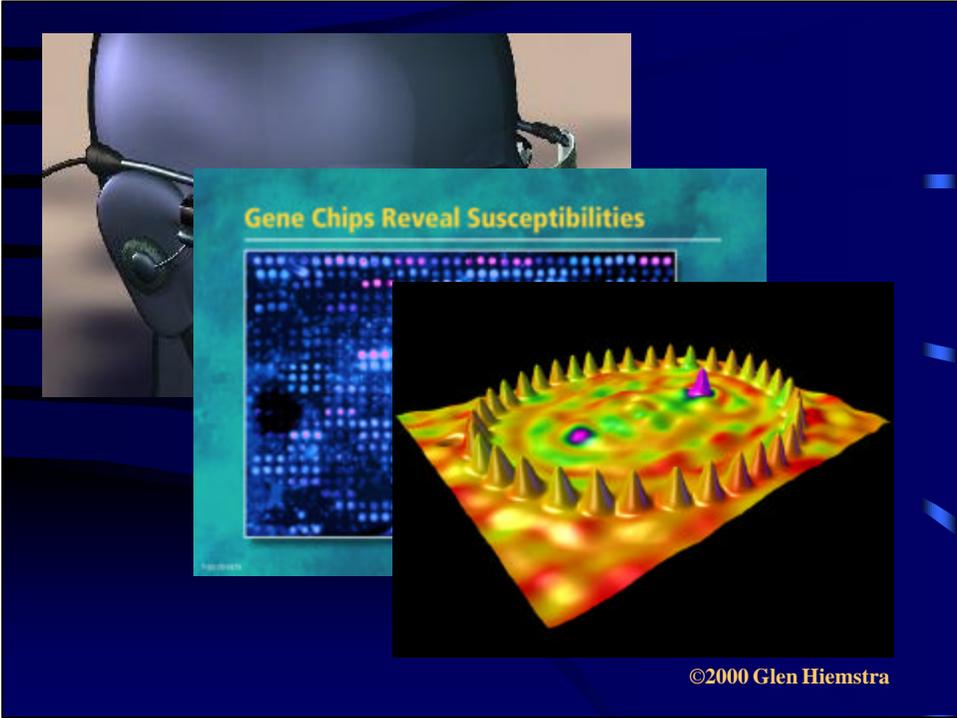
Throughout history, as soon as people can afford it they tend to choose the most private mode for local transportation, whether the sedan chair, the individual horse, the bicycle, the auto, the \_\_\_\_\_.

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Starting about 30 years ago it became necessary for all politicians to agree that the car was a problem, that sprawl was a disaster, and that transit was the key to the future, even though the public with their actions and dollars consistently indicates that they believe the opposite.

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**Pillars of 20th Century Life**

- The **JOB**
- The idea of **RETIREMENT**
- The **HOME** as we lived it
- **GOVERNMENT** Solutions
- **LEARNING** in Schools

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**Critical Drivers of the Future**



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## Demographic Dynamics

### The Dynamics of Change



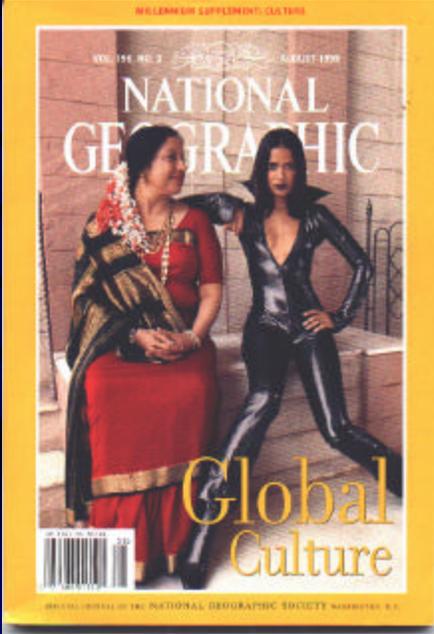
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Of all the 65 year olds  
who ever lived  
 $\frac{2}{3}$   
are alive today

**1900 - 10 million**  
**1992 - 342 million**  
**2050 - 2.5 billion**

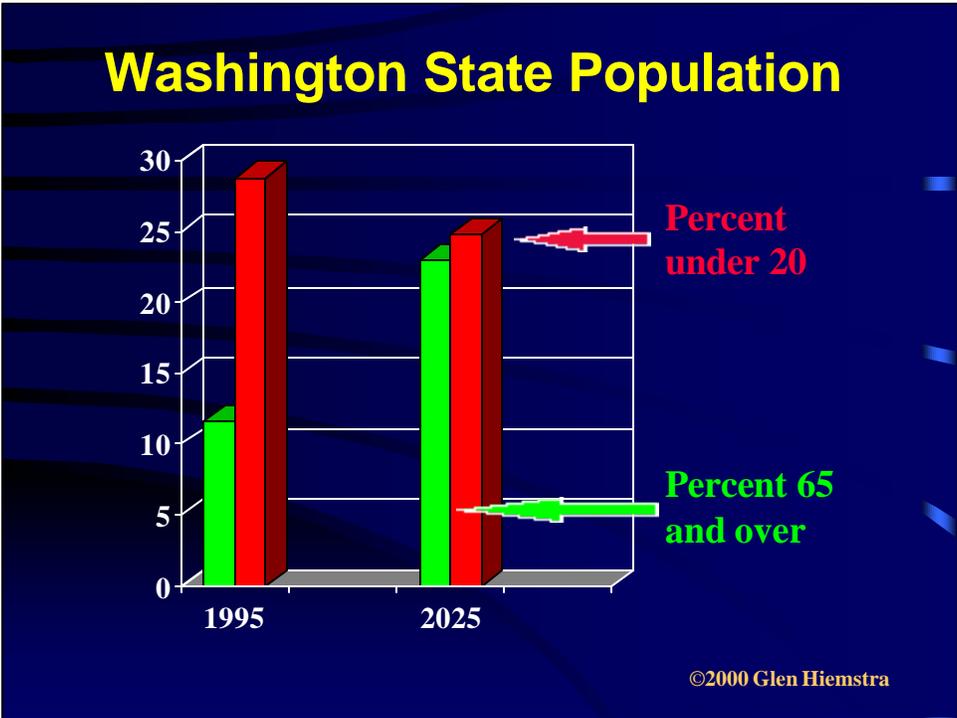


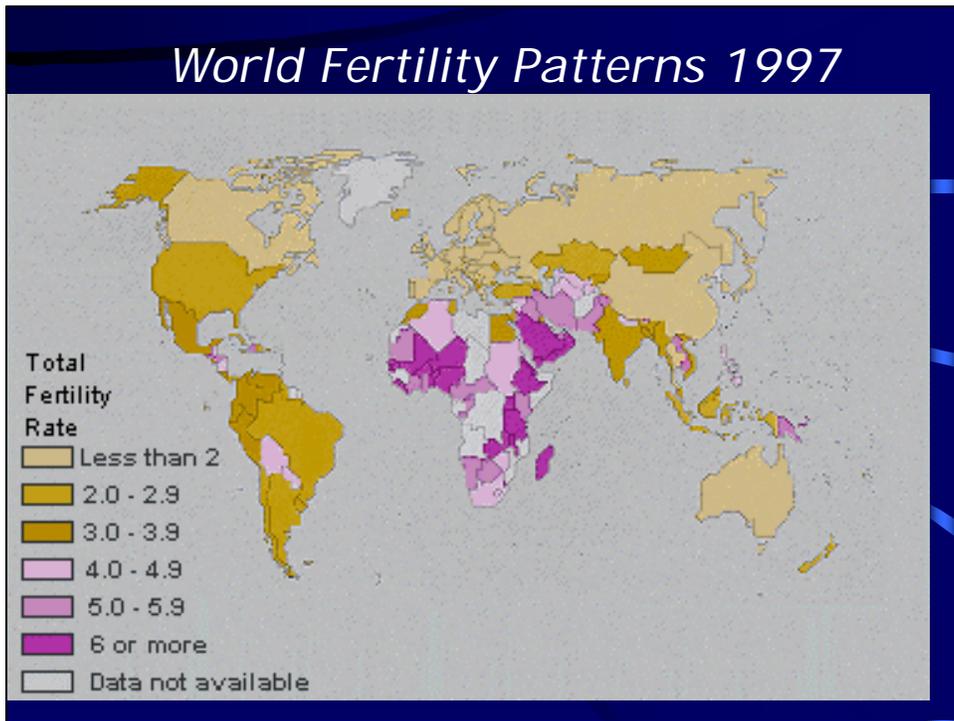
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**.com  
Generation**

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THURSDAY, JULY 20, 2000 A 15

#### Russia urges procreation to offset slip in population

**By Robert D'Avanzo**  
*Special*

MOSCOW — Russia may be the biggest country in the world by landmass, but there are fewer and fewer people to fill it, prompting experts to urge that compensate by trying to procreate a good deal more.

The number of people dying every day far outstrips the number of babies born in a country where the post-Soviet health-care system is crumbling and parents, hampered by economic crises, think twice about having children.

According to the government, Russia's birth rate fell to 1.17 children per woman in 1999 from 1.24 in 1996.

"We have a birth rate (lower) than developing countries and a mortality rate far higher than some Third World countries," said labor minister Alexander Pavlovich, who joined demogra-

phers at a discussion to mark U.N. World Population Day.

Russia's population has dropped by 4 million in 145 million over the past eight years, said Moscow State University demographer Valery Yelmarov.

Russia already has far fewer people than its former Cold War rival, the United States, or the 15-nation European Union, which is set to take in new members in the ex-Soviet bloc.

President Vladimir Putin raised the issue in his first address of the nation address Saturday. He said Russia could become a "senile nation" and the population could shrink by an additional 22 million in the next 15 years.

He announced a \$125 million program aimed at improving health care and said the government wanted to tackle the falling birth rate by convincing Russian parents that they could expect an economically stable future.

#### Germany sees population decline

**By Robert D'Avanzo**  
*Special*

BERLIN — Germany will need to close the retirement gap and import millions of unskilled workers to make up for a 20 percent fall in the population by 2050, a government report said yesterday.

The population of Europe's largest economy will drop by 17 million from 82 million 1999, even if 100,000 more people move to Germany each year than leave, the report by the Federal Statistics Office showed.

The report will give new urgency to pension reform efforts and step up an often bitter debate over immigration.

Thomas Huber, president of the Federal Statistics Office, said politicians finally were realizing the seriousness of the situation. In 1990 there were 16 million people under 20 or over 60. That will be reversed by 2050.

At least 1.1 million people would have to come to Germany every year to maintain the current population level, Huber said, but only 100,000 to 200,000 are expected annually.

Keeping Germany's population at its current 80 million means each woman would have to give birth to an average of 2.1 children. In western Germany, the average is about 1.6 births, lower in the eastern states.

A U.N. report in March suggested European countries would have to lower birth rates to women 2.05 to 2.2 and finance their welfare states in the narrow population age.

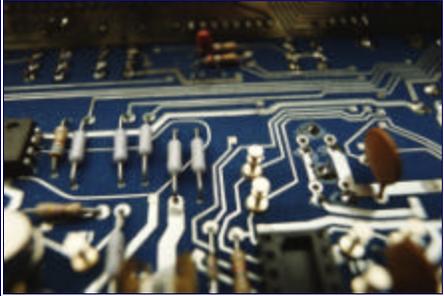
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## THE NETWORK ECONOMY

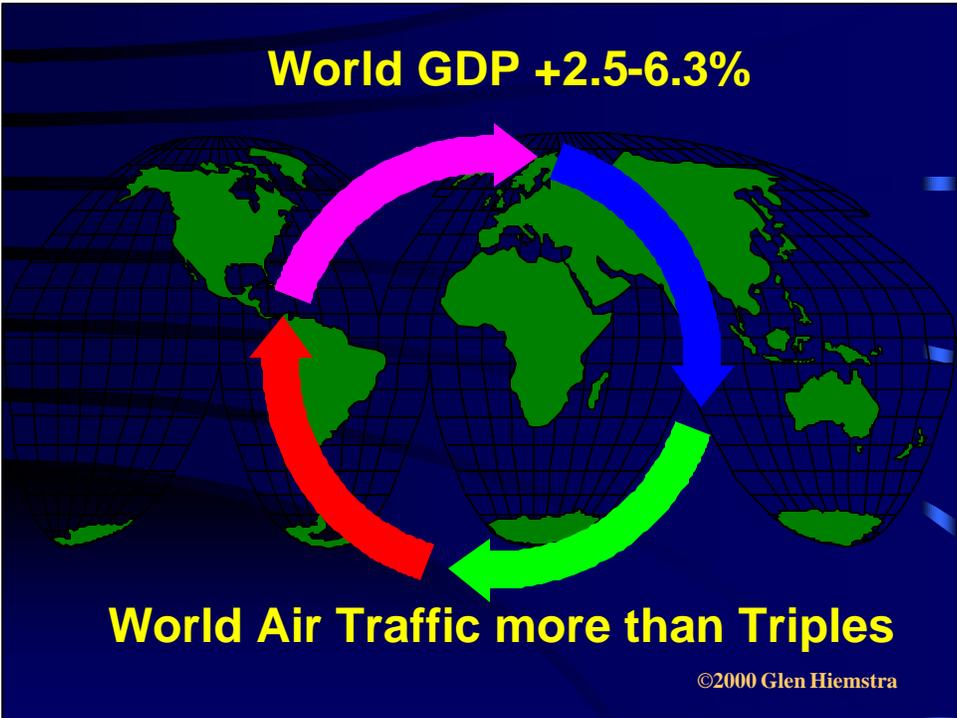
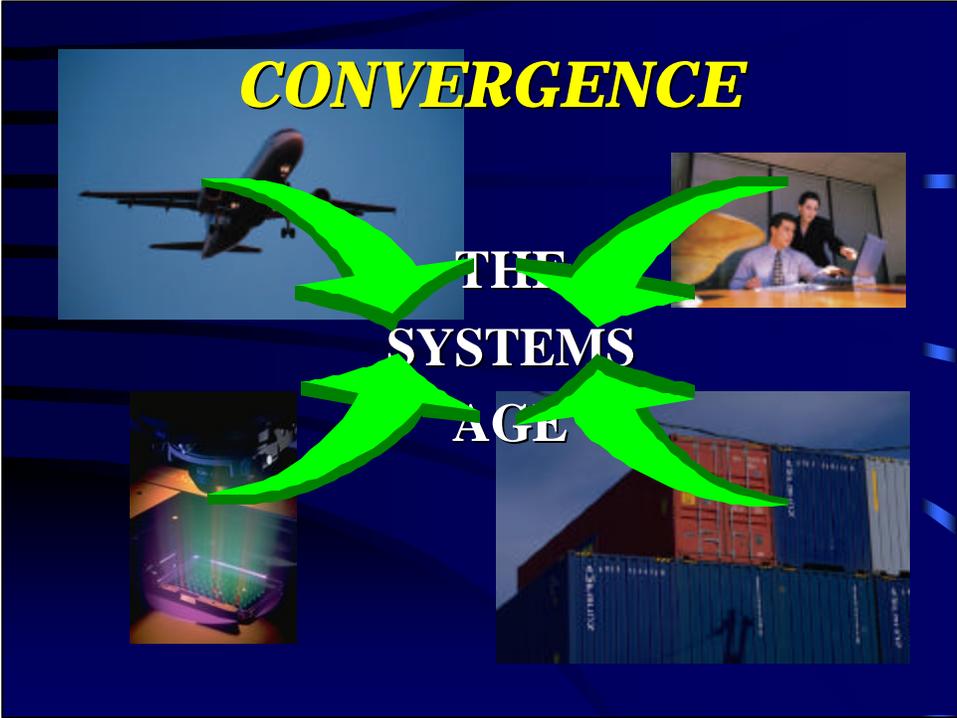
- ◆ **Global Economy Doubles Twice 1995-2025**
- ◆ **4 Factors Converge**

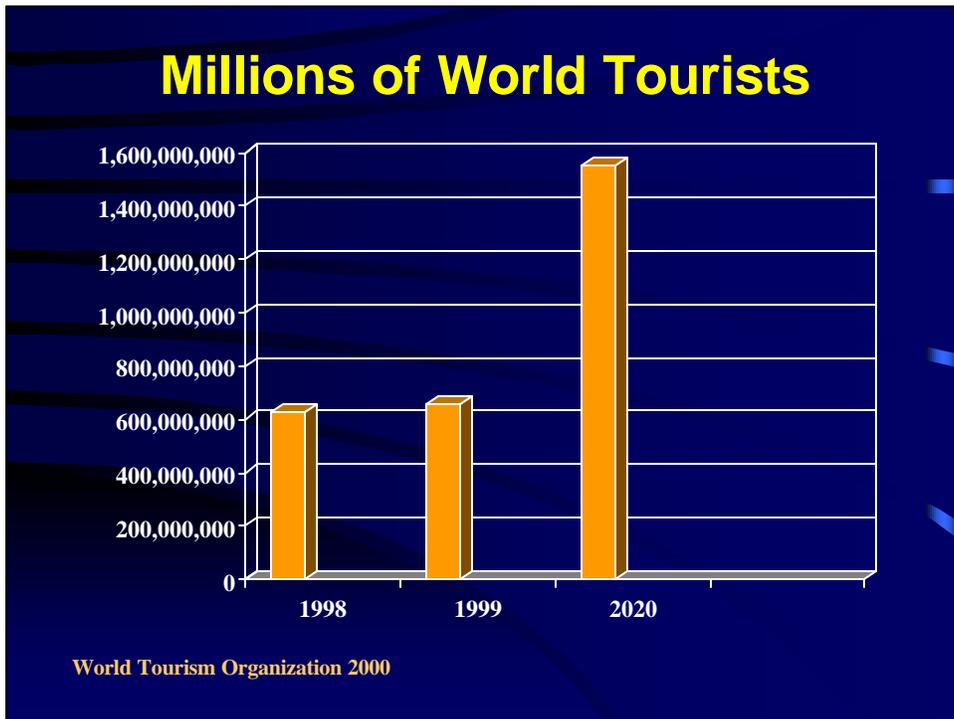


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<b>Rapid Innovation Technology Convergence</b>	<b>Real Investment In Productivity</b>
<b>Global Free Market</b>	<b>U.S. Spending Wave</b>

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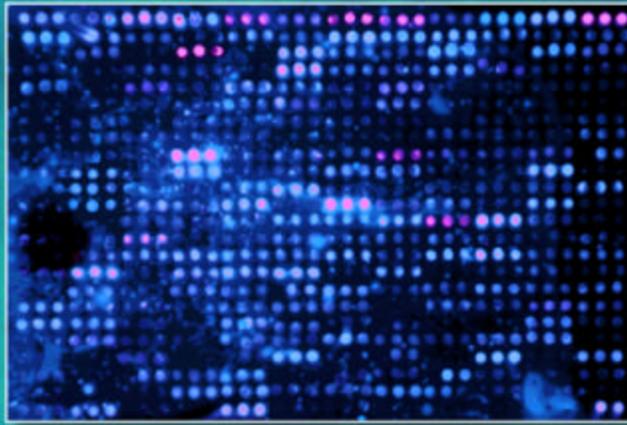
### Three Keys to Anticipating the Future

- ◆ Technologically Feasible?
- ◆ Economically Viable?
- ◆ Socially/Politically Acceptable?

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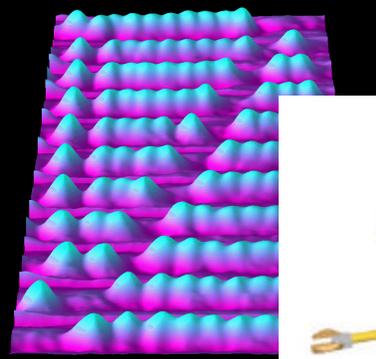
## Genomics

### Gene Chips Reveal Susceptibilities



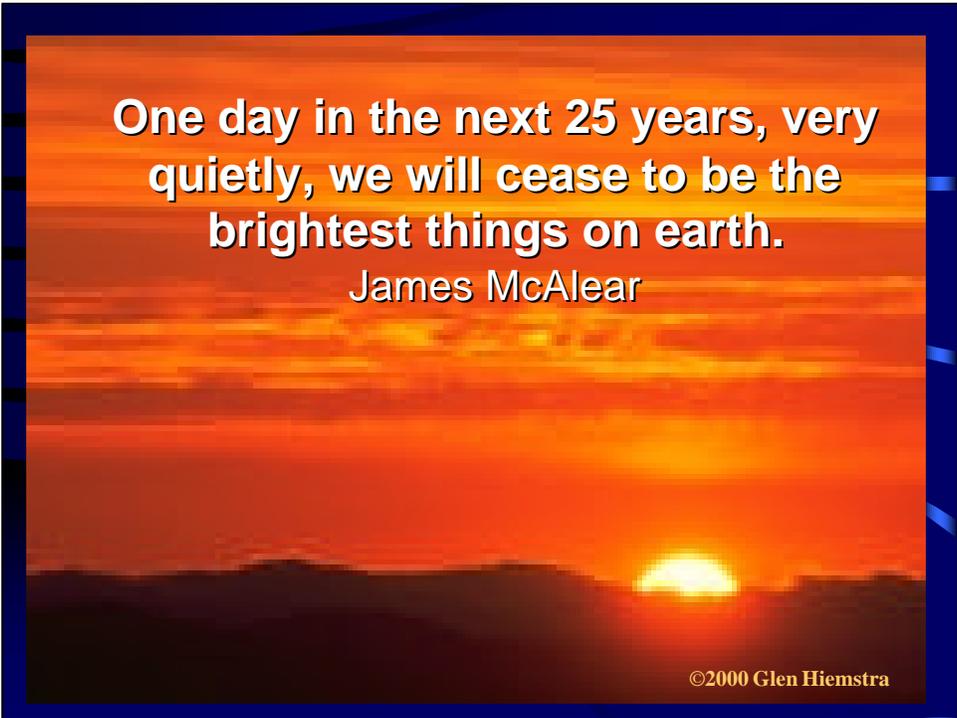
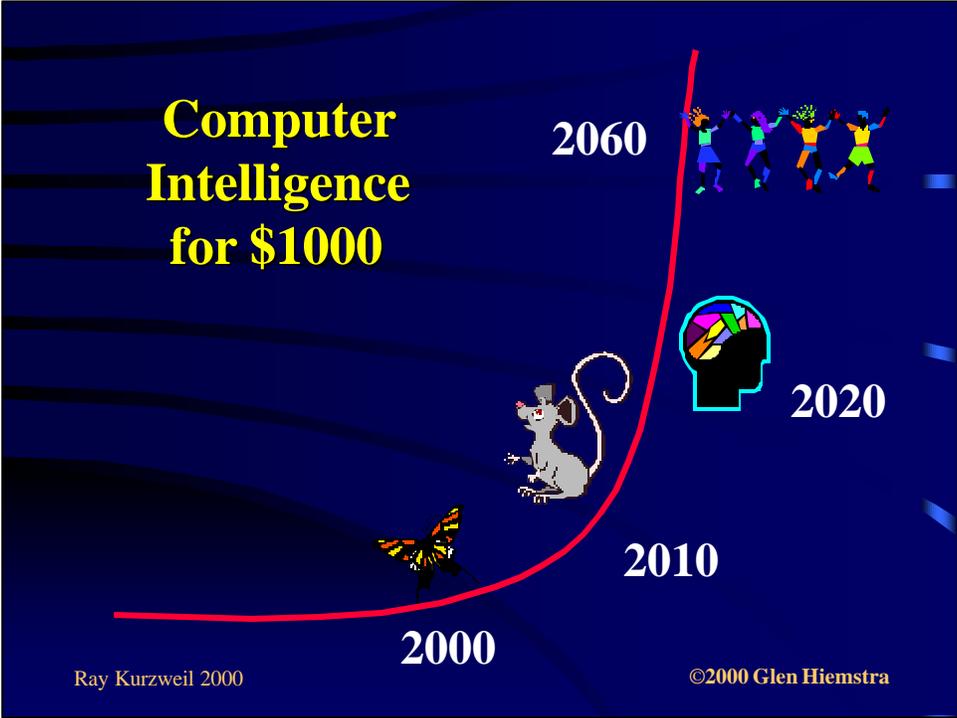
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## Nanotechnology



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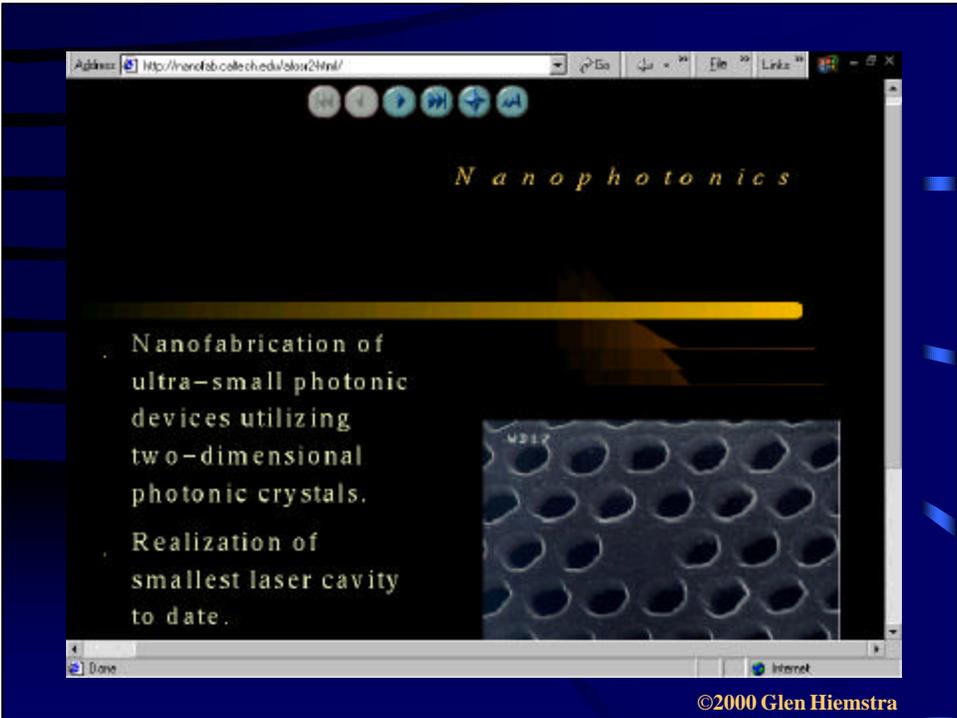
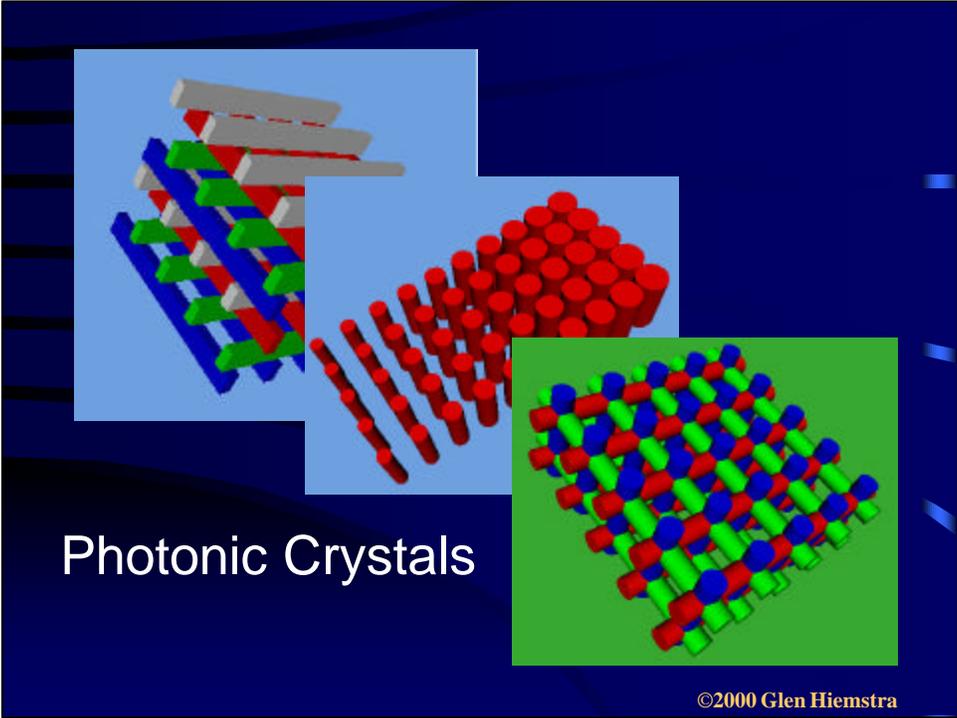
# Global Computer Emerges



From Mobile Com  
To Ubiquitous Com

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## Future Transportation Options



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## Does the Mode Match Values?

### Industrial Culture

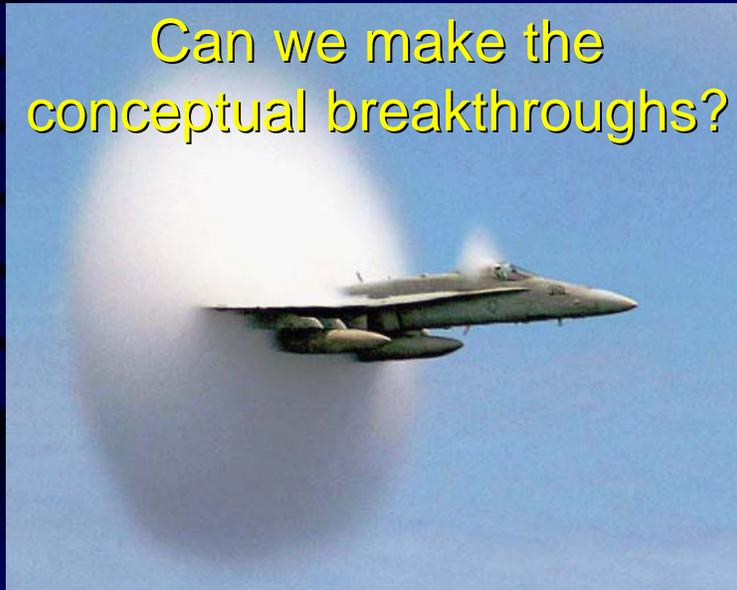
- Inflexible, Fixed
- Scheduled
- Slow
- Synchronous
- I am Controlled
- Mass
- Public
- Not owned
- Bureaucratic
- Managed

### New Culture

- Flexible
- Convenient
- Fast
- Asynchronous
- I Control
- Personal, Individual
- Private
- Ownership
- Entrepreneurial
- Self Organizing

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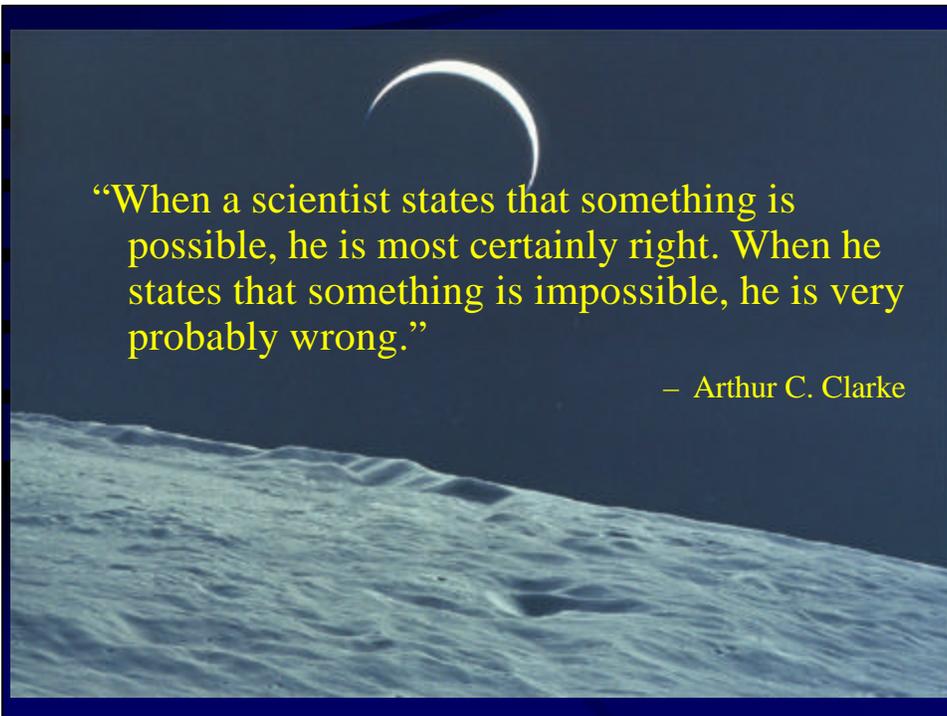
Can we make the  
conceptual breakthroughs?



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“When a scientist states that something is possible, he is most certainly right. When he states that something is impossible, he is very probably wrong.”

– Arthur C. Clarke





The future is not something that  
just happens to us.  
The future is something we do.

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