

The next 1,000 years; the "Big Five" engines of economic growth

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FOR THE PORTLAND OBSERVER

The current information era, made possible by communication and computer technology, is still reaching its zenith but has relatively few remaining years of dominance—possibly as few as 20. Two decades is not too short a time to start thinking seriously about what comes next.

Each new wave of the "Big Five" will enjoy a brief dominance, similar to the previous "Big Four." It will first become the largest provider of employment and soon thereafter account for the biggest share of gross domestic product. Careful research shows that the forces behind fundamental economic change begin to gather decades, even centuries, before the wave peaks. Each of the impending new economic waves is already well under way.

Leisure Time Era: Dominant by 2015

Leisure-oriented businesses—everything from bars to video stores to opera houses—will account for 50% of the U.S. gross national product shortly after 2015.

"Big entertainment" conglomerates that include film, television, publishing, music, hotels, and theme parks—such as Viacom-Paramount, Simon & Schuster, Disney's ABC, and Time-Warner-Turner—are in the forefront of this new sector.

Sometime prior to 2015, new technology and a number of other trends will allow people to devote over 50% of their lifetimes to leisure.

Life Sciences Era: Dominant by 2100

Life sciences will dominate economic activity by 2100 and well into the following century. Mapping the genomes of humans and other organisms opens up epoch-settling potentials. The secret of life itself, one of the most sought-after mysteries of all time, is beginning to be revealed. Understanding the "blueprints" for life will allow genetic engineers to control the evolution of plants, animals, and human beings.

As early as 2020, that power will cause the most divisive moral and ethical dilemmas of all time. Eugenics—humans taking conscious control of their evolution—is certain to become the most-controversial issue in these debates. Organized religion, along with other critics and crusaders, will exert powerful efforts to oppose life-altering genetic technologies.

Eventually, genetic principles will be applied to clone human organs for transplant and discover the mechanisms behind aging. The possibility of "immortality" looms.

Megamaterials Era: Dominant by 2200-2300

Megamaterials technologies, including the ability to disassemble and reconstruct matter at the atomic and subatomic levels, will radically transform the physical sciences, but will require considerable time. These technologies may dominate between 2200 and 2300. Megamaterials science unravels the mysteries of the myriad states and configurations of matter.

Nanotechnology, the fabrication of molecule-sized tools and machines, is a Lilliputian frontier only beginning to be explored. Nanotechnology will use fewer materials, consume less energy, and minimize waste.

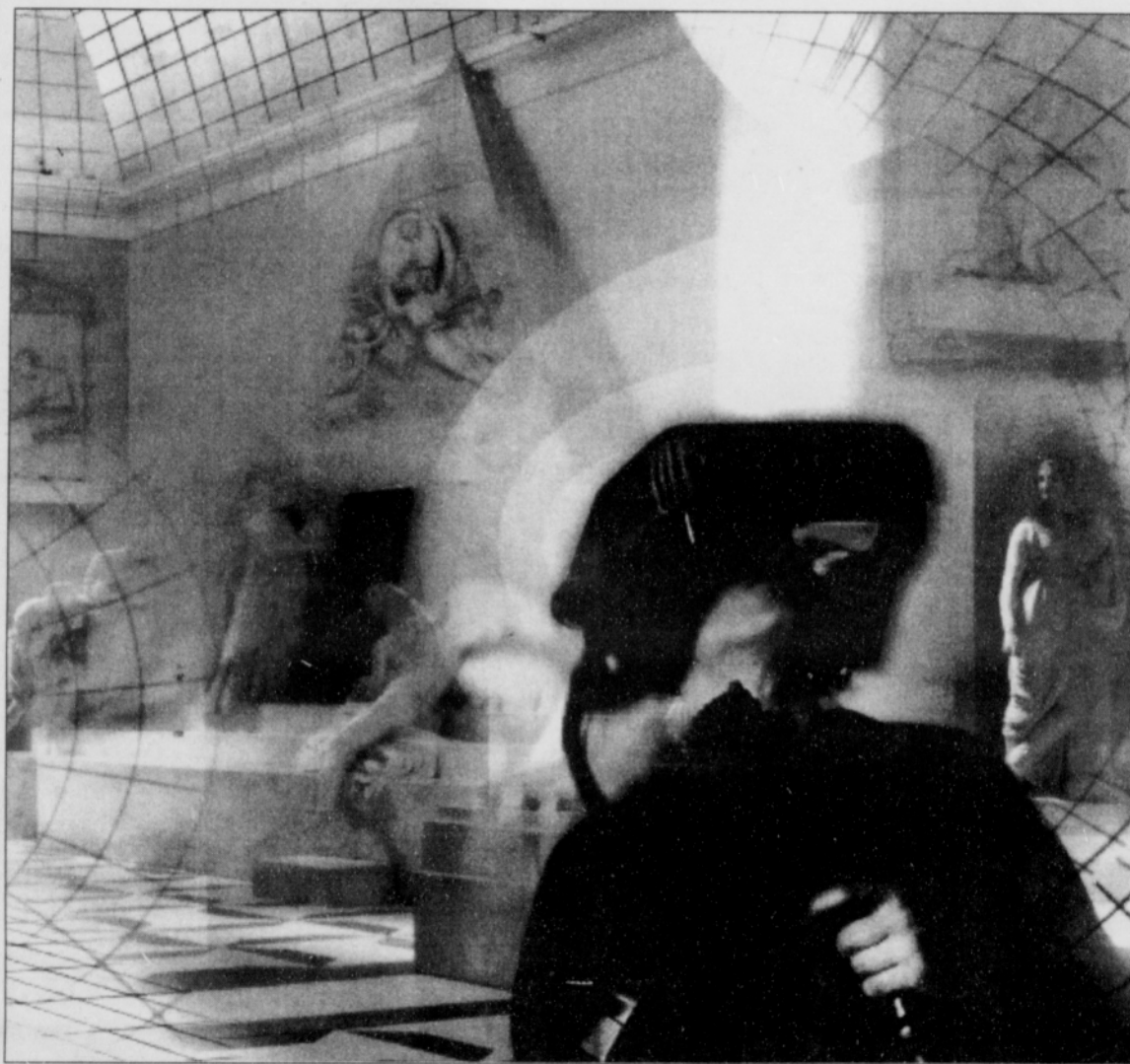
Megamaterials science will explore frontiers even smaller than nanotechnology: Step-by-step and part-by-part, the dizzying array of particles and/or wave forms that make up atomic structure continue to be discovered. Scientists are peeling away the other layers of the atom's nucleus like the layers of an onion and identifying numerous subatomic components. The innermost depths and dimensions of subatomic matter remain unfathomed.

Manipulation of atoms depends upon the ability to "see" or image atomic and subatomic structure and processes. X-ray probes can image the structure of molecules, proteins, and enzymes. New atomic force microscopes can resolve individual atoms. Once the precise nature of matter is understood, science will be able to control it at will. That time is not far away.

New Atomic Age: Dominant by 2100-2500

Thermonuclear fusion will usher in a New Atomic Age. Fusion uses virtually limitless hydrogen as fuel, and so it has the potential to satisfy unlimited energy needs. Once we learn to duplicate the hydrogen fusion that fuels the sun, humans will extract energy from their own "star-furnaces."

Since World War II, nuclear fission has been harnessed not only to create vast arsenals, but for scores of peaceful purposes. A growing number of nations are overwhelmingly dependent upon nuclear fission for their energy needs. That reliance will continue to grow. We can look forward to



According to Graham T.T. Molitor, a well renowned Futurist, in the next 20 years after the Information Age, five great eras (Leisure Time, Life Sciences, MegaMaterials, New Atomic, and New Space) will sweep through the world economy over the next 1,000 years.

New Space Age: Dominant by 2500-3000

Extraterrestrial enterprise will become the main engine of economic activity sometime prior to the year 3000, perhaps as early as 2500. For centuries, increasingly sophisticated telescopes and observational probes have been searching and studying the far reaches of the cosmos. Astrophysics and a score of other new fields of inquiry have slowly but steadily revealed secrets of the universe. Spacecraft, manned and unmanned, have begun the task of exploring outer space. The cosmos looms closer than ever.

Visionaries have already established businesses to arrange space travel for thrill seekers and for "burial" of cremated remains in the cosmos. Others foresee space colonies that would mine resources from the vast riches of this solar system, this galaxy, and beyond. The exploration of the universe will

occupy humanity into eternity. Many of the technologies needed for the New Space Age have been established. Now, these technologies need to grow.

Prospects for Progress

Today's fast-paced lifestyles and immediate concerns seldom encourage taking the long view. Our sense of history is vague. Yet, careful examination of the past and present is essential for projecting possible, probable, and preferable future prospects. The economic timeline presented here offers such a long view, allowing individuals to take advantage of future economic

opportunities, latching onto those on the upswing and sidestepping those on the downswing.

On a final note, studying the past and the present shows that the human condition has steadily, incrementally improved. We should be able to expect continued improvement in the years ahead.

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