The Third Wave

by Alvin Toffler.

Introduction

"This book.. contends that the world has not swerved into lunacy, and that, in fact, beneath the clatter and jangle of seemingly senseless events there lies a startling and potentially hopeful pattern... The Third Wave is for those who think the human story, far from ending, has only just begun" (Toffler 1980, 1).

Civilization can be divided into three major phases:

1. First Wave:	*the agricultural revolution*
2. Second Wave:	*the industrial revolution*
3. Third Wave:	*the information age (just now beginning)*

Each wave, or civilization phase, develops its own "super- ideology," or Zeitgeist, with which it explains reality and justifies its own existence. This ideology impacts all the spheres which make up a civilization phase:

- technology
- social patterns
- information patterns
- "power" patterns

"Humanity faces a quantum leap forward. It faces the deepest social upheaval and creative restructuring of all time. Without clearly recognizing it, we are engaged in building a remarkable new civilization from the ground up... What is happening now is nothing less than a global revolution, a quantum jump in history" (Toffler 1980, 10; 12).

Timing:

"...the agricultural revolution.. took thousands of years to play itself out. [The industrial revolution] took a mere three hundred years. Today history is even more accelerative, and it is likely that the Third Wave will sweep across history and complete itself in a few decades" (Toffler 1980, 10).

A powerful new approach to historical analysis: ""Social Wave-Front Analysis".. looks at history as a sucession of rolling waves of change and asks where the leading edge of each wave is carrying us. It focuses our attention not so much on the continuities of history (important as they are) as on the discontinuities--the innovations and breakpoints. It identifies key change patterns as they emerge, so that we can influence them" (Toffler 1980, 13).

The Waves defined

THE FIRST WAVE

- The agricultural revolution took thousands of years to play out.
- Extent of spread: "Today the First Wave has virtually subsided. Only a few tiny tribal populations, in South America or Papua New Guinea, for example, remain to be reached by agriculture" (Toffler 1980, 13).
- "..land was the basis of economy, life, culture, family structure, and politics" (Toffler 1980, 21).
- "..life was organized around the village."
- "..a simple division of labor prevailed and a few clearly defined castes and classes: a nobility, a priesthood, warriors, helots, slaves or serfs. In all of them, power was rigidly authoritarian. In all of them, birth determined one's position in life."
- ".. the economy was decentralized, so that each community produced most of its own necessities" (Toffler 1980, 21).
- The First Wave was dominant until around 1650-1750.

THE SECOND WAVE

- The industrial revolution took three hundred years to mature.

- Extent of spread: "..having revolutionized life in Europe, North America, and some other parts of the globe [the western Soviet Union, Japan, Hong Kong, Singapore, Taiwan, Australia, New Zealand, South Korea, and parts of mainland China]... continues to spread as many countries, until now basically agricultural, scramble to build steel mills, auto plants, railroads.." (Toffler 1980, 14). "In all, industrial civilization embraces roughly one billion human beings--one fourth the population of the globe" (Toffler 1980, 24).

- "Industrialism was more than smokestacks and assembly lines. It was a rich, many-sided social system that touched every aspect of human life and attacked every feature of the First Wave past... it put the tractor on the farm, the typewriter in the office, the refrigerator in the kitchen. It produced the daily newspaper and the cinema, the subway and the DC-3... It gave us Bauhaus buildings and Barcelona chairs, sit-down strikes, vitamin pills, and lengthened life spans. It universalized the wristwatch and the ballot box" (Toffler 1980, 22).

- The Civil War was fought over who would rule the continent: farmers or industrialists.

- Major changes wrought by the Second Wave:

    - A shift to NONRENEWABLE ENERGY SOURCES -- coal, gas, and oil -- made mass production possible.

    - A radically better distribution system--MASS DISTRIBUTION instead of custom distribution--using railroads, highways, and canals, and "complex networks of jobbers, wholesalers, commission agents, and manufacturers' representatives." This led to MASS MERCHANDISING.

    - Industrialization required mobility from people. This resulted in the end of the large multigenerational, extended family rooted to the soil. "The so-called NUCLEAR FAMILY--father, mother, and a few children, with no encumbering relatives--became the standard, socially approved, "modern" model in all industrial societies" (Toffler 1980, 28).

    - "To free workers for factory labor, key functions of the family were parceled out to new, specialized institutions. EDUCATION of the child was turned over to schools. CARE OF THE AGED was turned over to poor-houses or old-age homes or nursing homes" (Toffler 1980, 28).

    - "As work shifted out of the fields and the home.. children had to be prepared for factory life. The early mine, mill, and factory owners of industrializing England discovered, as Andrew Ure wrote in 1835, that it was 'nearly impossible to convert persons past the age of puberty..

into useful factory hands.'... Built on the factory model, MASS EDUCATION taught basic reading, writing, and arithmetic... Beneath [this overt curriculum, however] lay an invisible or "covert curriculum" that was far more basic. It consisted--and still does in most industrial nations--of three courses: one in punctuality, one in obedience, and one in rote, repetitive work. Factory labor demanded workers who showed up on time.. It demanded workers who would take orders from a management hierarchy without questioning. And it demanded men and women prepared to slave away at machines or in offices, performing brutally repetitious operations" (Toffler 1980, 29).

- Mass production required giant pools of capital. To encourage investors, the "concept of limited liability was introduced" and THE CORPORATION was created.

- "In one Second Wave country after another, social inventors, believing the factory to be the most advanced and efficient agency for production, tried to embody its principles in other organizations as well. Schools, hospitals, prisons, government bureaucracies, and other organizations thus took on many of the characteristics of the factory--its division of labor, its hierarchical structurel and its metallic impersonality" (Toffler 1980, 31)--in other words, BUREAUCRACY.

  "Music provides a striking example. As the Second Wave arrived, concert halls began to crop up in London, Vienna, Paris, and elsewhere. With them came the box office and the impresario--the businessman who financed the production and then sold tickets to culture consumers.

  "The more tickets he could sell, naturally, the more money he could make. Hence, more and more seats were added. In turn, however, larger concert halls required louder sounds--music that could be clearly heard in the very last tier. The result was a shift from chamber music to symphonic forms" (Toffler 1980, 32).

- In an agricultural society, information was simple and usually conveyed orally. Industrialization, however, "required the tight coordination of work done at many locations" (Toffler 1980, 33). Hence, huge amounts of INFORMATION had to be written down and then accurately and efficiently distributed. This gave rise to the postal service, to memos, to the telephone, telegraph, and two- way radio.

- There also arose a demand for the distribution of information from one source to millions of people. Hence, MASS MEDIA and mass advertising arose. The mass circulation newspaper and magazine became a standard part of life.

- HUMAN LIFE WAS SPLIT into two halves: PRODUCTION AND CONSUMPTION.

"Until the industrial revolution, the vast bulk of all the food, goods, and services produced by the human race was consumed by the producers themselves [or] their families" (Toffler 1980, 37).

"Pecuniary transactions were a fringe on a world of natural economy.

"The Second Wave violently changed this situation... it created.. a situation in which the overwhelming bulk of all food, goods, and services was destined for sale, barter, or exchange. It virtually wiped out of existence goods produced for one's own consumption... and created a civilization in which almost no one, not even a farmer, was self-sufficient any longer. Everyone became almost totally dependent upon food, goods, or services produced by somebody else" (Toffler 1980, 39).

The market place moved from a peripheral position to the center of everyone's life. "Most people were sucked into the money system... This explosive expansion of the market contributed to the fastest rise in living standards the world had ever experienced" (Toffler 1980, 40).

"..the obsessive concern with money, goods, and things is a reflection not of capitalism or socialism, but of industrialism. It is a reflection of the central role of the marketplace in ALL societies in which production is divorced from consumption, in which everyone is dependent upon the marketplace rather than on his or her own productive skills for the necessities of life" (Toffler 1980, 41).

"Behavior came to be seen as a set of transactions. Instead of a society based on friendship, kinship, or tribal or feudal allegiance, there arose in the wake of the Second Wave a civilization based on contractual ties, actual or implied. Even husbands and wives today speak of marital contracts.

"The cleavage between these two roles--producer and consumer--created at the same time a dual personality. The very same person who (as a producer) was taught by family, school, and boss to defer gratification, to be disciplined, controlled, restrained, obedient, to be a team player, was simultaneously taught (as a consumer) to seek instant gratification, to be hedonistic rather than calculating, to abandon discipline, to pursue individualistic pleasure--in short, to be a totally different kind of person" (Toffler 1980, 42).

- The Sexual Split

  "One of the most common sexual stereotypes in industrial society defines men as 'objective' in orientation, and women as 'subjective'" (Toffler 1980,

43).

As the Second Wave took over, it demanded that men in particular learn to watch the clock, to obey orders, to remove their personal feelings from the work place--to be "objective." Every operation depended on many men doing the correct thing at the correct time. Personal feelings had nothing to do with the situation.

"This victory of interdependence over self- sufficiency, however, was never fully consummated. In one place the older form of work stubbornly held on. This place was the home.

"Each home remained a decentralized unit engaged in biological reproduction, in child-rearing, and in cultural transmission. If one family failed to reproduce, or did a poor job of rearing its children and preparing them for life in the work system, its failures did not necessarily endanger the accomplishment of those tasks by the family next door...

"The housewife continued, as always, to perform a set of crucial economic functions. She 'produced,'... [but] not for the market...

"Women, prepared from birth for the tasks of reproduction, child-rearing, and household drudgery, performed to a considerable degree in social isolation, were taught to be 'subjective'--were frequently regarded as incapable of the kind of rational, analytic thought that supposedly went with objectivity...

"...the modern 'battle of the sexes' can be traced in large measure to the conflict between two work-styles" (Toffler 1980, 43-45).

THE CODE OF SECOND WAVE CIVILIZATION

"Every civilization has a hidden code--a set of rules or principles that run through all its activities... As industrialism pushed across the planet, its unique hidden design became visible. It consisted of a set of six interrelated principles that programmed the behavior of millions. Growing naturally out of the divorce of production and consumption, these principles affected every aspect of life from sex and sports to work and war" (Toffler 1980, 46).

1. Standardization

Usually associated with mass production, few people notice that we have applied this principle to almost every aspect of life: standardized tests, mass education, pay scales, lunch hours, holidays, mass media, weights and measures, currency,

prices (as opposed to negotiation), language, leisure activities, lifestyle.

2. Specialization

The "jack-of-all-trades" was replaced with the specialist.

"[Adam] Smith, in a classic passage, described the manufacture of a pin. A single old-style workman, performing all the necessary operations by himself, he wrote, could turn out only a handful of pins each day--no more than twenty and perhaps not even one. By contrast, Smith described a 'manufactory' he had visited in which the eighteen different operations required to make a pin were carried out by ten specialized workers, each performing only one or a few steps. Together they were able to produce more than forty-eight thousand pins per day--over forty-eight hundred per worker" (Toffler 1980, 49).

Specialization brought the emergence of the professions. "Whenever the opportunity arose for some group of specialists to monopolize esoteric knowledge and keep newcomers out of their field, professions emerged... Thus, health in Second Wave societies came to be seen as a product provided by a doctor and a health-delivery bureaucracy, rather than a result of intelligent self-care by the patient. Education was supposedly 'produced' by the teacher" (Toffler 1980, 50).

".. Lenin argued that the masses could not bring about a revolution without professional help. What was needed, he asserted, was an 'organization of revolutionaries' limited in membership to 'people whose profession is that of a revolutionary" (Toffler 1980, 51).

3. Synchronization

Second Wave people dealt with time differently. "In a market-dependent system... time equals money. Expensive machines cannot be allowed to sit idly... the high cost of machinery and the close interdependence of labor required a much more refined synchronization.

"If one group of workers in a plant was late in completing a task, others down the line would be further delayed. Thus punctuality, never very important in agricultural communities, became a social necessity, and clocks and watches began to proliferate" (Toffler 1980, 51-2).

"Not by coincidence, children in industrial cultures were taught to tell time at an early age" (Toffler 1980, 52).

"...social life, too, became clock-driven and adapted to machine requirements. Certain hours were set aside for leisure. Standard-length vacations, holidays, or coffee breaks were interspersed with the work schedules...

"...chiefly men became the most conditioned to clock- time... Women, primarily

engaged in noninterdependent housework, worked to less mechanical rhythms... Second Wave husbands continually complained that their wives kept them wiating, that they had nor regard for time, that it took them forever to dress, that they were always late for appointments" (Toffler 1980, 52).

"For similar reasons urban populations tended to look down upon rural folk as slow and unreliable" (Toffler 1980, 52).

4. Concentration of energy, money, and power.

We became "almost totally dependent on highly concentrated deposits of fossil fuel.

"[The Second Wave].. also concentrated population, stripping the countryside of people and relocating them in giant urban centers"(Toffler 1980, 53).

Work was concentrated in the factory.

The poor were concentrated in ghettoes. (In First Wave societies the poor live with relatives.)

Criminals were concentrated in jails. (In First Wave societies, "criminals are fined, whipped, or banished from one settlement to another.")

The insane were concentrated in assylums. (In First Wave societies, the insane stayed with their families, or were supported by the community.)

The education of children was concentrated in schools. (In First Wave societies, children are educated in the home, and then by tutors living with the family, or by the local clergyman.)

"The early nineteenth century, in fact, has been called THE TIME OF THE GREAT INCARCERATIONS--when criminals were rounded up and concentrated in prisons, the mentally ill rounded up and concentrated in 'lunatic assylums', and children rounded up and concentrated in schools, exactly as workers were concentrated in factories" (Toffler 1980, 53).

Concentration has continued to operate as the Second Wave has become stronger. There are only three major auto companies in the U.S. Two Japanese firms produce all the VCR's in the world. In each area of production--aluminum, beer, cigarettes, breakfast foods, etc.--three to five companies produce almost all of it.

5. Maximization

The Second Wave created in us an "infatuation with bigness and growth... 'Big' became synonymous with 'efficient'" (Toffler 1980, 54).

The workers and managers of Matsushita Electric Company in Japan, chant this song every morning when they exercise together:

"...Doing our best to promote production, Sending our goods to the people of the world, Endlessly and continuously, Like water gushing from a fountain. Grow, industry, Grow, Grow, Grow! Harmony and sincerity! Matsushita Electric!" (Toffler 1980, 55).

By 1960, the fifty largest corporations in the United States employed an average of 80,000 workers each.

By 1970, AT&T, by itself, employed 956,000 people. "This meant, at an average household size of 3.3, that well over [three million] people were dependent upon paychecks from this one company alone" (Toffler 1980, 55).

"Stalin pushed even harder for maximum scale and built vast new projects--the steel complex at Magnitogorsk, anoth at Zaporozhstal, the Balkhash copper smelting plant, the tractor plants at Kharkov and Stalingrad. He would ask how large a given American installation was, then order construction of an even larger one" (Toffler 1980, 56).

6. Centralization

In Business

"The early railroads provide a classic illustration. Compared with other businesses they were the giants of their day. In the United States in 1850 only forty-one factories had a capitalization of $250,000 or more. By contrast, the New York Central Railroad as early as 1860 boasted a capitalization of $30,000,000. To run such a gargantuan enterprise, new management methods were needed.

"The early railroad managers, therefore, like the managers of the space program in our own era, had to invent new techniques. They standardized technologies, fares, and schedules. They synchronized operations over hundreds of miles. They created specialized new occupations and departments. They concentrated capital, energy, and people. They fought to maximize the scale of their networks. And to accomplish all this they created new forms of organization based on centralization of information and command" (Toffler 1980, 57).

"...centralized management came to be regarded as an advanced, sophisticated tool in all the Second Wave nations.

In Politics

"In politics, too, the Second Wave encouraged centralization. In the United States, as early as the late 1780's, this was illustrated by the battle to replace the loose, decentralist Articles of Confederation with a more centralist Constitution"

(Toffler 1980, 57).

In the Economy

The CENTRAL BANK was a crucial invention. It facilitated the central control of money and credit.

(The Bank of England, le Banque de France, the Reichsbank, the Federal Reserve System in the U.S.)

NB: All these principles, together, led to the rise of Bureaucracy.

WHO RUNS THINGS

1. Managers/administrators -- they integrate all the specializations; they link all the parts of the system.

2. Big government -- "the biggest coordinator of all" (64). Through coercive powers and tax revenues, big government accelerated the second wave's implementation.

3. Leading business men and lawyers on civic committees and boards -- An informal power pyramid which facilitated second wave systems.

4. Investment moguls -- At the top of the power pyramid, their investments create the parameters for all other activities.

NB: "Today, as the Third Wave of change begins to batter at this fortress of managerial power, the first fleeting cracks are appearing in the power system. Demands for participation in management, for shared decision-making, for worker, consumer, and citizen control, and for anticipatory democracy are welling up in nation after nation. New ways of organizing along less hierarchical and more ad-hocratic lines are springing up in the most advanced industries. And managers become more and more dependent upon information from below. Elites themselves, therefore, are becoming less permanent and secure. All these are merely early warnings-- indications of the coming upheaval in the political system.

"The Third Wave, already beginning to batter at these industrial structures, opens fantastic opportunities for social and political renovation. In the years just ahead startling new institutions will replace our unworkable, oppressive, and obsolete integrational structures" (67-8).

THE HIDDEN POLITICAL STRUCTURE

On the surface the political systems of different countries look unique.

Underneath, their structures are the same.

Land is central to every system (a holdover from the First Wave). All elections are based on a geographic division, not on social class, occupation, or ethnic group.

The factory model of every component depending on the performance of other components required the suppression of localism and the encouragement of a national and international consciousness.

The idea of representation is also central -- a holdover from the First Wave perception that most people are rural farmers and don't have the education or brains to govern themselves, but rather need to be represented by one of the educated elite.

In every country, there is a universal set of components:

1. Individuals armed with the vote.
2. Parties for collecting the votes.
3. Candidates who, when they win, become representatives of the voters.
4. Legislatures (parliaments, diets, assemblies) in which representative manufacture laws by voting.
5. Executives (presidents, prime ministers, party secretaries) who feed policies into the lawmaking machine, and then enforce the resulting laws.

This same structure was recreated at the state, county, and local level, creating a hierarchical structure which is all tied together.

This "law factory" is used by those in power to manipulate the global system... ELECTIONS are a "reassurance ritual" which "take the steam out of protests from below" (76).

NB: "In this system, representative government was the political equivalent of the factory... Like most factories it was managed from above. And like most factories, it is now increasingly obsolete, a victim of the advancing Third Wave" (78).

THE IMPERIAL DRIVE

"Second Wave civilization could not exist... [without] the hidden subsidy of cheap resources" from First Wave countries. Hence:

- the drive for empire, for control over distant lands.
- the racist attitudes and prejudices which justified the domination of foreign lands--"the white man's burden".

"...Grand imperialism paid off handsomely. As the economic historian William

Woodruff put it: 'It was the exploitation of these territories and the growing trade done with them that obtained for the European family wealth on a scale never seen before.' Built deep into the very structure of the Second Wave economy, feeding its ravenous need for resources, imperialism marched across the planet.

"In 1492 when Columbus first set foot in the New World, Europeans controlled only 9 percent of the globe. By 1801 they ruled a third. By 1880, two thirds. And by 1935 Europeans politically controlled 85 percent of the land surface of the earth and 70 percent of its population." (90-91).

At the end of the Second World War, the United States gained economic control of much of the world by the creation of three institutions:

1. International Monetary Fund (IMF)--compelled its member nations to peg their currency to the American dollar or to gold (most of which was held by the U.S.).

2. The World Bank--provided funds to rebuild after the war, and also to build further infrastructure in third-world countries for the more efficient mvement of raw materials to Second Wave nations.

3. General Agreement on Tariffs and Trade (GATT)--liberalized trade, making it difficult for the poorer, less technologically advanced countries, to protect their tiny fledgling industries.

Summary: "..the economic growth of the Second Wave nations would in all probability have been stunted.. without the concealed subsidies made possible by imperialism... Second Wave Civilization might well be today where it was in 1920 or 1930" (97).

NB: "...rampant industrialism was more than an economic, political, or social system. It was also a way of life and a way of thinking. It produced a Second Wave mentality... This mentality stands today as a key obstacle to the creation of a workable Third Wave civilization" (97).

THE SECOND WAVE MENTALITY ("Indust-Reality")

"..the Second Wave brought with it a redefinition of God... of justice... of love... of power... of beauty. It stirred up new ideas, attitudes, and analogies. It subverted and superseded ancient assumptions about time, space, matter, and causality. A powerful, coherent world view emerged that not only explained but justified Second Wave reality" (98).

The world seems to be divided into left-wing and right-wing advocates, totalitarian regimes and democracies, people in every circumstance divided into

two or more ideological camps.

"What few noticed, however, in the heat of this propaganda war, was that while each side promoted a different ideology, both were essentially hawking the same superideology" -- a version of reality, of overarching ideas and assumptions, taught to all children of industrialism so that they might understand their world. This world view was based on three deeply intertwined beliefs:

1. Nature is an object waiting to be exploited. (Earlier cultures accepted poverty as a part of the harmony of mankind with the surrounding ecology.)

2. Humans are not merely in charge of nature, they are the pinnacle of a long process of evolution, of natural selection... "Social Darwinism." (a rationalization for imperialism).

3. The progress principle -- the idea that history flows irreversibly toward a better life for humanity. This was the common theme of Leibniz, Turgot, Condorcet, Kant, Lessing, John Stuart Mill, Hegel, Marx, Darwin, and countless lesser thinkers.. They argued over the details... but they all nodded in agreement at the notion of progress itself (102).

CONSEQUENCES:

These underlying beliefs, taught to children of industrialization, led to the following patterns of behavior:

- Time-obsession, always glancing at their watches. This time-consciousness was necessary for the synchronization required in industrial systems. It contrasted sharply with the slower pace and longer view of agricultural societies.

"Second Wave civilization did more than cut time up into more precise and standard chunks. It also placed these chunks in a straight line that extended indefinitely back into the past and forward into the future. It made time linear.

"Indeed, the assumption that time is linelike is so deeply embedded in our thoughts that it is hard for htose of us raised in Second Wave societies to conceive of any alternative. Yet many preindustrial societies, and some First Wave societies even today, see time as a circle, not a straight line. From the Mayas to the Buddhists and the Hindus, time was circular and repetitive, history repeating itself endlessly, lives perhaps reliving themselves through reincarnation.... The notion of circular time is found in Plato and Aristotle... It was taught by Pythagoras." (104).

- A spatially extended culture. Agriculture had required permanent settlements. Industrialism caused vast populations to migrate in search of jobs. Huge, teeming populations were compressed into booming industrial centers. The entire landscape was dramatically re-worked.

- Emphasis on precise measurement. Just as time had to be precisely used to coordinate activities, so measurement of space and resources had to be measured by common standards. "A day's ride" was no longer an adequate measure of distance.

- An "atomistic" view of reality. There was a deliberate assault on the notion of oneness. To facilitate industrialization, people had to be torn loose from their extended families and the church. "Industrial capitalism needed a rationale for individualism... The person was no longer merely a passive appendage of tribe, caste, or clan but a free, autonomous individual. Each individual had the right to own property, to acquire goods, to wheel and deal, to prosper, to starve according to his or her own active efforts" (111).

- Explanations through causality. Newton's discovery of gravity led eventually to the belief that "not only the cosmos and nature but society and people behaved according to certain fixed and predictable laws" (113).

"..a universe that had seemed complex, cluttered, unpredictable, richly crowded, mysterious, and messy, began to look neat and tidy" (113).

"This new causality, combined with the new images of time, space, and matter, liberated much of the human race from the tyranny of ancient mumbo jumbo... but [it] also created its own new prison, an industrial mentality that derogated or ignored what it could not quantify, that frequently praised critical rigor and punished imagination, that reduced people to oversimplified protoplasmic units, that ultimately sought an engineering solution for any problem" (114).

RESULTS OF ALL THESE FACTORS:

- The spread of literacy

- Improvement of roads and transport

- A widening split between consumer and producer

- A new social character: industrial man

- Dependence of survival on money

- Creation of the nuclear family

- Factory-like schools
- Man's image of the world controlled by mass media
- Most people work for a big corporation
- Successive generations grew taller than their parents
- Nakedness came to be regarded as shameful--invention of nightclothes
- Eating became technologized--diffusion of forks and other specialized table implements
- Damage to the earth's fragile biosphere
- Enslavement of Indians -- imperialism
- Massification of war -- unleashed the atom

FACTORS WHICH MAKE CONTINUATION OF THE SECOND WAVE IMPOSSIBLE:

- The biosphere will no longer tolerate the industrial assault.
- Nonrenewable energy sources are drying up (one of the hidden subsidies of the Second Wave) *{Prediction here--we are at the end of cheap energy}*
- The supply of cheap raw materials is drying up as we reach the end of colonialism.-- *{Prediction here--costs of things will rise substantially}*
- Disintegrative pressures inside the system--people and systems are becoming strained beyond the ultimate breaking point: the family system in the U.S., the telephone system in France, the commuter rail system in Tokyo, the welfare system, the postal systems, the school system, health-delivery systems, etc.

NB: "Once we think in terms of successive waves of interrelated change, of the collision of these waves, we grasp the essential fact of our generation--that industialism is dying away--and we can begin searching among signs of change for what is truly new, what is no longer industrial. We can identify the Third Wave.

"It is this Third Wave of change that will frame the rest of our lives. If we are to smooth the transition between the old dying civilization and the new on that is taking form, if we are to maintain a sense of self and the ability to manage our own lives through the intensifying crises that lie ahead, we must be able to recognize--

and create--Third Wave innovations" (124).

THE THIRD WAVE -- THE NEW SYNTHESIS

- The newest wave--called the technetronic age by Zbigniew Brzezinski, called the post-industrial society by Sociologist Daniel Bell, often commonly called the information age--should take only a few decades to mature.

To see the new, emerging, patterns we must resist two powerful Second Wave forms of thinking:

1. Analysis. We cannot see the future in the same way we solve problems--by dismantling problems into their component parts. We must practice, instead, synthesis.

2. Linearity. We must resist the temptation to be seduced by straight lines. Tomorrow will not be just an extension of today. Trends, no matter how powerful, do not continue in a straight line.

The new technologies of the Third Wave will bring:

- Diversified, renewable, energy sources. (Ex. -- bio-electronics, piezo-electronics, new computer systems which shut everything down for nano-seconds between actual activity.)

- Methods of production which make factories and assembly lines obsolete.

This change will driven by two factors:

- the rise of dynamic new industries based on scientific breakthroughs: quantum electronics, information theory, molecular biology, oceanic, nucleonics, ecology, and the space sciences

- Enhanced manipulative abilities via computers, data processing, aerospace, sophisticated petrochemicals, semiconductors, advanced communications, solid-state physics, systems engineering, artificial intelligence, fuzzy logic, polymer chemistry.

"..four clusters of related industries are poised for major growth and are likely to become the backbone industries of the Third Wave:

1. Electronics and computers...

   According to Computerworld magazine, "If the auto industry had done what the computer industry has done in the last 30 years, a Rolls-Royce would cost $2.50 and get 2,000,000 miles to the gallon."

A "radically accelerated.. energy crisis... [will] carry us toward processes and products that are miserly in their energy requirements" (141).

2. The space industry...

   "Despite delays, five space shuttles may soon be moving cargo and people back and forth between the earth and outer space on a weekly schedule. The impact of this is as yet underestimated by the public, but many companies in the United States and Europe regard the "high frontier" as the source of the next revolution in high technology and are acting accordingly" (142).

   Many high tech materials require delicate handling... SPACE MANUFACTURING is a hot topic among scientists, engineers, and high tech executives. "McDonnell Douglas offers to pharmaceutical companies a space shuttle device that will separate rare enzymes from human cells. Glass manufacturers are looking at ways of making materials for lasers and fiber optics in space. Space-produced single-crystal semiconductors make earth-made models seem primitive. Urokinase, a blood clot dissolver needed for patients suffering from certain forms of blood disease, now costs $2,500 per dose. According to Jesco von Puttkamer, chief of space industrialization studies for NASA, it could be manufactured in space for less than one fifth that amount...

   More important are the totally new products that simply cannot be made on earth at virtually any price. TRW, an aerospace and electronics company, has identified four hundred different alloys that we cannot manufacture on earth because of the pull of gravity. General Electric, meanwhile, has begun the design of a space furnace.

3. Pushing into the depths of the sea...

   The mirror image of our drive into space... "The first historic wave of social change on earth came when our ancestors ceased to rely on foraging and hunting, and began instead to domesticate animals and cultivate the soil. We are now at precisely this stage in our relationship to the seas." (143).

   - Enough protein could be grown in the sea to end world hunger.
   - Intelligent aquaculture could also preserve the fragile biosphere of our planet.
   - Oil can be "grown" in the ocean. It has already been demonstrated that algae, high in oil content, can be grown in the ocean. The process is on the edge of becoming economically effective.
   - The oceans contain an overwhelming wealth of minerals. The Red Sea alone holds an estimated $3.4 billion worth of zinc, silver, copper, lead,

and gold. This does not include phosphate ores which are used for land-based farm fertilization, but also potato-shaped manganese nodules-- a renewable resource which constantly form on the ocean floor.

- The gene industry...

Probably the biggest future of them all. Information on genetics is doubling every two years.

Lord Ritchie-Calder explains that "Just as we have manipulated plastics and metals, we are now manufacturing living materials."

Major companies--Eli Lilly, HOffmann-La Roche, G.D. Searle, Upjohn, Merck--"dream of placing enzymes in the automobile to monitor exhaust and send data on pollution to a microprocesor that will then adjust the engine. They speak of what The New York Times calls 'metal-hungry microbes that might be used to mine valuable trace metals from ocean water'" (146).

Some other ideas being discussed:

- We could breed people with cowlike stomachs so they can digest grass and hay, thus eliminating the food problem by modifying us to eat lower down on the food chain.
- We could biologically alter workers to fit job requirements--for example, creating pilots with faster reaction times or assembly-line workers neurologically designed to do our monotonous work for us.
- We could clone soldiers to do our fighting.
- We could use genetic forecasting to pre-eliminate "unfit" babies.
- We could grow reserve organs for ourselves.
- We could create life forms which convert sunlight into electro-chemical energy, replacing nuclear power plants.
- We can reduce or eliminate the need for oil in the production of plastics, fertilizer, clothes, paint, pesticides, and thousands of other products.
- We can drastically improve the production of wood, wool, and other natural goods.

4. De-massification of the media

As the quantity of information available to people expands, they become less and less able to cope with it. People fall back to paying attention to only what is important to them.

Hence we see the loss of readership of newspapers and mass magazines, and the loss of viewers of the large, generic television channels. Instead, we see a rise in the number of specialty channels appealing to narrow segments of the population. Likewise, mini-circulation specialty weekly newsletters and magazines are explosively increasing.

The new media is not "mass"; instead it is specialized, aimed at small, special-interest, regional, or even local markets. Cable systems are being designed for two-way communication for even more refined customization.

"All these different developments have one thing in common: they slice the mass television public into segments, and each slice not only increases our cultural diversity, it cuts deeply into the power of the networks that have until now so completely dominated our imagery" (164).

"The Third Wave thus begins a truly new era--the age of the de-massified media. A new info-sphere is emerging along-side the new techno-sphere. And this will have a far-reaching impact on the most important sphere of all, the one inside our skulls. For taken together, these changes revolutionize our images of the world and our ability to make sense of it" (165).

One problem this trend presents is that fewer and fewer people seek the larger picture. The over-supply of information has caused them to settle for "blips" of information, which they then attempt to string together in a sensible manner to account for changes in their environment.

5. An intelligent environment.

   Home computers (PC's) are facilitating electronic communities (The Source, Internet, listservs).

   Microprocessors allow the automation of our entire environment.

   "Imagine, you're at work, the phone rings. It's Fred, your house. While monitoring the morning news reports for stories of recent burglaries, Fred picked up a weather bulletin warning of pending heavy rain. This jogged Fred's bubble memories to run a routine roof maintenance check. A potential leak was found. Before calling you, Fred phoned Slim for advice. Slim is a ranchstyle home down the block... Fred and Slim often shared data bankcs and each knew they were programmed with an effective search technique for identifying household services... You've learned to trust Fred's judgment, and approve the repairs. The rest is rather straight forward, Fred calls the roofer..."(171).

In another direction, Peter Ritner, in the Society of Space, wrote of what he called 'weave problems.' "He warned that we would increasingly face crises that were 'not susceptible to 'cause and effect analysis' but would require 'mutual dependence analysis'; not composed of easily detachable elements but of hundreds of cooperating influences from dozens of independent, overlapping sources.'

"Because it can remember and interrelate large numbers of causal forces, the computer can help us cope with such problems at a deeper than customary level. It can sift vast masses of data to find subtle patterns. It can help assemble "blips" into larger, more meaningful wholes. Given a set of assumption, or a model, it can trace out the consequences of alternative decisions, and do it more systematically and completely than any individual normally could. It can even suggest imaginative solutions to certain problems by identifying novel or hitherto unnoticed relationships among people and resources." (174)

It could be one antidote to blip culture.

"At the same time, the intelligent environment may eventually begin to change not merely the way we analyze problems and integrate information, but even the chemistry of our brains. Experiments by David Krech, Marian Diamond, Mark Rosenzweig, and Edward Bennett, among others, have shown that animals exposed to an "enriched" environment have larger cerebral cortices, more glial cells, bigger neurons, more active neurotransmitters, and larger blood supplies to the brain than animals in a control group. Can it be that, as we complexify the environment and make it more intelligent, we shall make ourselves more intelligent as well?" (175)

6. A new social memory...

"Our remarkable ability to file and retrieve shared memories is the secret of our species' evolutionary success. And anything that significantly alters the way we construct, store, or use social memory therefor touches on the very wellsprings of destiny" (176).

"Twice before in history humankind has revolutionized its social memory. Today, in constructing a new info-sphere, we are poised on the brink of another such transformation" (176).

Originally human groups stored their shared memories in the minds of individuals (like Homer, tribal elders, wise men, etc.).

The Second Wave smashed the memory barrier by spreading mass literacy. Now systematic records could be kept. Libraries and museums were built. "By increasing the store of cumulative knowledge, it accelerated all the processes of innovation and social change" (176).

Today we are about to make another quantum leap. With massive files of information on mainframes, with a PC in almost every person's hands, we are recording the activities of the civilization in fine-grain detail, and we have random access to the records. "..we shall before long have the closest thing to a civilization with total recall" (177).

7. Development of the "electronic cottage"

   Mass production, like mass media, is nearly obsolete and on the way out. "..while 'the less highly developed countries-- [those] with a GNP of between U.S. $1000-2000 per capita per annum--concentrate on mass produced manufacturers' the 'most highly developed countries.. concentrate on the export of one- off and short-run manufactured goods depending on highly skilled labour and.. high research costs: computers, specialised machinery, aircraft, automated production systems, high technology paints, pharmaceutical products, high technology polymers and plastics'" (182).

   "The step beyond this, of course, is complete customization-- the actual manufacture of one-of-a-kind products. And that is clearly the direction in which we are heading: products custom-cut for individual users" (183).

   "The shift toward customization is perhaps best symbolized by a computer-based laser gun introduced a few years ago into the clothing industry... [it] operates on a radically different principle. It does not cut 10 or 50 or 100 or even 500 shirts or jackets at a time. It cuts one at a time. But it actually cuts faster and cheaper than the mass-production methods employed until now. It reduces waste and eliminates the need for inventory. For these reasons, according to the president of Genesco, one of the largest manufacturers of apparel in the United States, 'The laser machines can be programmed to fill an order for one garment economically.' What that suggests is that some day even standard sizes may disappear. It may be possible to read one's measurements into a telephone, or point a video camera at oneself, thus feeding data directly into the computer, which in turn will instruct the machine to produce a single garment, cut exactly to one's personal, individualized dimensions." (184).

   But there is a logical step beyond this. "Hidden inside our advance to a new production system is a potential for social change so breathtaking in scope that few among us have been willing to face its meaning... Apart from encouraging smaller work units, apart from permitting a decentralization and de- urbanization of production, apart from altering the actual character of work, the new production system could shift literally millions of jobs out of the factories and office into which the Second Wave swept them and right back where they came from originally: the home. If this were to happen, every institution we know, from the family to the school and the corporation, would be transformed" (194).

There are many reasons why people would not want to move back to their own homes to work.... "Yet there were equally, if not more, compelling reasons three hundred years ago to believe people would never move out of the home and field to work in factories. After all, they had labored in their own cottages and the nearby land for 10,000 years, not a mere 300. The entire structure of family life, the process of child-rearing and personality formation, the whole system of property and power, the culture, the daily struggle for existence were all bound to the hearth and the soil... yet these chains were slashed in short order as soon as a new system of production appearedl... Today that is happening again" (195).

There is already an appreciable amount of work being done at people's homes: salesmen, architects, designers, consultants, therapists, psychologists, music teachers, language instructors, art dealers, investment counselors, insurance agents, lawyers, academic researchers, and many other professional and technical people.

"These are, moreover, among the most rapidly expanding work classifications" (197). The addition of PC's, FAX machines, networks on telephone lines, the information highway, teleconferencing, etc., the number of people capable of working from home increases dramatically.

Consider the cost incentives to companies. Commuting, which they indirectly subsidize, runs an average of 29 times as much as the installation of telecommunication equipment in a person's home. In addition, huge savings in real estate costs, capital building investments, and building maintenance can be had. Staying at home will also reduce pollution, and the cost of cleaning it up.

On the home side, as shorter work weeks become common, "the higher ratio of commuting time to working time [becomes] more irrational, frustrating, and absurd" (203). In addition, shared work has traditionally helped to bind families together. "..when campaigners for familylife discover the possibilities inherent in the transfer of work to the home we may well see a rising demand for political measures to speed up the process--tax incentives, for example, and new conceptions of workers' rights" (203).

8. The home-centered society

As the electronic cottage spreads, a chain of consequences will occur in society:

- Greater community stability due to less forced mobility, less stress on the individual, fewer transient human relationships, and a greater participation in community life.
- A renaissance among voluntary organizations like churches, women's

groups, lodges, clubs, athletic and youth organizations.

- Energy requirements will be reduced due to energy decentralization. Energy demand would be spread out, making it easier to use solar, wind, and other alternative energy technologies.

- The auto industry, oil companies, and commercial real estate developers would be hurt.

- Electronics industry, computer companies, and the communications industries would flourish.

- Increasingly, workers would own the means of production (reference Marx, Marcuse).

9. Families will become non-nuclear.

   Many say the family is falling apart today. They define the family as a husband-breadwinner, mother-housekeeper, and a numebr of children. This is the "nuclear family" which was created and idealized by the Second Wave. It is falling apart, because the Second Wave industrial complex system is falling apart.

   If we really want to maintain the nuclear family, here's what we would have to do:

   - Freeze all technology in its Second Wave stage to maintain a factory-based, mass-production society.

   - Block the rise of the service and professional sectors in the economy. White-collar, professional, and technical workers are less traditional, less family-oriented, more intellectually and psychologically mobile than blue- collar workers.

   - "Solve" the energy crisis by applying nuclear and other highly centralized energy processes. The nuclear family survives better in a centralized society.

   - Return to mass media, and ban cable television, cassettes, local and regional magazines and radio programs. Nuclear families work best where there is a national consensus on information and values, not in a society based on high diversity.

   - Forcibly drive women back into the kitchen. Reduce wages for those who insist on working. The nuclear family has no nucleus when there are no adults left at home.

- Slash the wages of young workers to make them more dependent, for a longer time, on their families.

- Ban contraception. This makes for independence of women and for extramarital sex, a notorious lossener of nuclear ties.

- Cut the standard of living of the entire society to pre-1955 levels, since affluence makes it possible for single people, divorced people, working women, and other unattached individuals to "make it" economically on their own.

- Resist all changes in our society which lead toward diversity, freedom of movement and ideas, or individuality. The nuclear family remains dominant only in a mass society.

What we are currently witnessing is the demise of the nuclear family and the emergence in its place of a diversity of family forms.

In the First Wave, we looked for mates who were strong enough to help make a living on a farm. In the Second Wave, we came to look for a mate we loved--companionship, sex, warmth, and support.

In the Third Wave, working in the electronic cottage, we may look for LOVE PLUS -- sexual and psychological gratification PLUS brains. In the future, John Denver may sing:

> I love your eyes, your cherry lips,
> the love that always lingers,
> your way with words and random blips,
> your skilled computer fingers. (219)

Children, in the electronic cottage, may return to the work force, both helping the family and expanding their education.

"In fact, integrating young people into work in the electronic cottage may offer the only real solution to the problems of high youth unemployment. This problem will grow increasingly explosive in many countries in the years ahead, with all the attendant evils of juvenile crime, violence, and psychological immiseration, and cannot be solved within the framework of a Second Wave economy except by totalitarian means--drafting young people, for example, for war or forced service" (220).

"..we need to begin removing the unwarranted guilt that accompanies the breakup and restructuring of families... The decision to live outside a nuclear family framework should be made easier, not harder... Instead of exacerbating unjustified guilt, the media, the church, the courts, and the

political system should be working to lower the guilt level" (224).

10. Radically changed corporations.

    "The big corporation was the characteristic business organization of the industrial era" (226). Just like families, the mass media, and schools, corporations are facing drastic changes:

    - A crisis in the world economy.

      A jet-age (computer-based) money system is taking shape. A sprawling network of international banks has created a balloon of "stateless currency"--money and credit outside the control of any individual government. Several trillion dollars in loans--based on no cash reserves--is threatening to blow up in everyone's face.

    - An accelerated economy.

      There is a drastic speed-up in the pace of business. An accelerating wave of change, pushed by the coming Third Wave, is causing disorientation, frustration, and increased mistakes on the part of managers.

    - The de-massified society.

      "Today, as the Third Wave strikes, the corporate manager finds all his old assumptions challenged... the marketplace and the labor market.. are beginning to break into smaller, more varied pieces.... Second Wave corporations.. are uncertain how to cope with this rising tide of diversity among their employees and customers" (231-2).

      Nationalism is now becoming regionalism. "The pressures of the melting pot are replaced by the new ethnicity" (233).

    - Public anger at corporations

      People are demanding a new definition of what corporations are and what they do. They want to see more responsibility and more accountability, "not merely for its economic performance but for its side effects on everything from air pollution to executive stress" (234).

      The result will be corporations who attend to multiple bottom lines. Some examples are already happening: Amoco, Control Data Corporation, Pillsbury, AT&T, and Chemical Bank are all focusing attention on social impacts as well as economic results.

11. New code of behavior

- Punctuality and synchronization will no longer be critical. We will have a new sense of time--witness flextime (Gleitzeit--sliding, or flexible, time). Punctuality, like morality, will become situational.

- Increased night work.

- Part-time work will become much more common. People will become more willing "to settle for a smaller paycheck in return for time to pursue their own hobbies, sports, or religious, artistic, or political interests" (248).

- Meals will become further desynchronized; there will no longer be a standard three meals per day. More fast-food shops will appear.

- Flexible schedules will require new services to keep track of friends and family.

- Standardization will disappear. All pricing will become more like automobiles--varying with options and with what you negotiate. Consensus in politics will break down; more issue groups will pursue narrow goals. Countries will lose their sense of national culture; more regional cultures will arise.

- Decentralization will occur--new political parties ("neighborhood power"), new management techniques ("matrix" organizations where you have more than one boss), new philosophies to challenge the centralist premisses of the Second Wave.

- National economies will break up into regional economies.

- The value of specialization and professionalism will decline.

12. Rise of the Prosumer
    - This began in the early 1970's with the introduction of the do-it-yourself pregnancy kit.

    - Rapidly growing movement -- "millions of people... are beginning to perform for themselves services hitherto performed for them by doctors... what these people are really doing is shifting some production from Sector B [the "visible economy"] to Sector A [the "invisible economy"]" (267).

    - The self-help movement is another facet of this trend.

    - Other examples of this trend are long-distance direct- dialing, self-service fuel pumps, electronic banking, self-service supermarkets, discount stores.

- More and more thins are sold knocked down, ready for "easy assembly" at home.
- Appliances, like refrigerators, are starting to come with 1-800 numbers to call for repairs--they walk YOU through the repair process.
- The do-it-yourself industry is experiencing explosive growth.
- All the above demonstrates the "LAW OF RELATIVE INEFFICIENCY." "This holds that the more we automate the production of goods and lower their per-unit cost, the more we increase the relative cost of handcrafts and nonautomated services" (273).
- "For such reasons, we must expect the price of many services to continue their sky-rocketing climb in the years ahead... [this will] make it increasingly 'profitable' for people to produce for their own consumption" (273).
- This suggests a future economy in which "leisure time" is redefined as "unpaid work;" people will never hold a full-time job, but spend extensive time "producing" their own goods and services with immensely enhanced self-help technologies.
    - Instead of buying a shirt, you will make your own with a "smart" electronic sewing machine.
    - You will purchase a new car by purchasing a "kit" and building it yourself.
- "What is the real meaning of unemployment? Is a laid-off auto worker who puts a new roof on his house, or overhauls his car, unemployed in the same sense as one who sits idly at home watching football on television?" (282).
- "Battles will flare over which needs will be met by which sector of the economy. Struggles will sharpen, for example, over licensing, building codes, and the like, as Second Wave forces attempt to hold on to jobs and profits by preventing prosumers from moving in... " (283).
- Teachers' unions typically fight to keep parents out of the classroom... [but] a number of educational problems cannot be resolved without the parent" (283).

13. Radically changed schools.

    (see separate notes on homeschooling)

14. Breakup of the nation state.
    - As populations become more diverse, the high-tech nations will crack up into smaller and less powerful units.
    - Like trans-national corporations, various trans-national networks, or groups, will form to pursue their economic and other interests. (The Common Market is a good example)

"Many countries.. are feeling the simultaneous impact of two, even three, quite different waves of change, all moving at different rates of speed and with different degrees of force behind them" (Toffler 1980, 14).

"..in our personal lives and in our political acts, whether we know it or not, most of us in the rich countries are essentially either Second Wave people committed to maintaining the dying order, Third Wave people constructing a radically different tomorrow, or a confused, self-canceling mixture of the two" (Toffler 1980, 16).

"Once we realize that a bitter struggle is now raging between those who seek to preserve industrialism and those who seek to supplant it, we have a powerful new key to understanding the world" (Toffler 1980, 18).

FORCES FOR AND AGAINST CHANGE

"...Second Wave forces are those who favor the old, mindless approach to technology: 'If it works, produce it. If it sells, produce it'" (151).

There is also "a small, vocal fringe of romantic extremists hostile to all but the most primitive First Wave technologies, who seem to favor a return to medieval crafts and hand labor" (151).

"Ranged against both these extremes is an increasing number of people in every country who form the core of the techno- rebellion... agents of the Third Wave. They begin not with technology but with hard questions about what kind of future society we want" (152). Their guiding principles are as follows:

- The earth's biosphere is fragile, so new technologies should be pre-screened for adverse effects.
- Technology should be controlled by more than just the small elite of scientists, engineers, politicians, and businessmen.
- "The heavy-handed technologies of the Second Wave seemed more efficient than they actually were because corporations and socialist enterprises

externalized-- transferred to society as a whole--the enormous costs of cleaning up pollution, of caring for the unemployed, or dealing with work-alienation" (152). In contrast, appropriate technologies for the future should provide humane jobs, avoid pollution, spare the environment, and produce for personal or local use rather than for national and global markets alone.

- More technology should be devoted to the world's poor countries and populations.

- The larger system should be metabolic in nature. The output of every production system should be the input for another. Everything should be recyclable.

THE COMING PHILOSOPHICAL REVOLT

Symptoms:

- A mounting attack on establishment science.
- A wildfire revival of fundamentalist religion.
- A desparate search for something to believe in.

Underlying cause:

- A "collision of the emerging Third Wave culture with the entrenched ideas and assumptions of industrial society" (289).

Forecast:

- A philosophical revolt which will overthrow the assumptions of the past 300 years.

- Key ideas of the industrial period will be "discredited, discounted, superseded, or subsumed into much larger and more powerful theories" (289).

Ex. 1 -- Our view of nature.

- We are moving to a non-adversarial, symbiotic relationship with nature.

- "We are now looking at phenomena that are bigger, smaller, and faster by orders of magnitude than any we exmained during the Second Wave past. Today we are probing phenomena that are as tiny as 1/1,000,000,000,000,000th [quadrillionth] of a centimeter in an explorable universe whose edge lies at least 100,000,000,000,000,000,000,000 [one hundred sextillion] miles away. We are studying phenomena so short-lived that they occur in 1/10,000,000,000,000,000,000,000th [ten sextillionth] of a

second" (291).

Ex. 2 -- Our view of evolution

- At the molecular level, scientists are finding that biological evolution does not follow Darwinian natural selection, but random "genetic drift."
- "Fresh research is now... leading to the unsettling notion that the simpler life forms may have descended from the more complex," and not vice versa. (292)
- The unraveling of the structure of DNA by James Watson and Francis Crick, and the current ongoing Genome Project, mean that we are about to become the designers of evolution.

Ex. 3 -- Our view of time

- Scientists are now telling us that "time isn't something that flows inexorably forward at the steady pace indicated by our clockes and calendars, but that it can be warped and distorted in nature, with the end product being different depending on just where you are measuring it from. At the ultimate extreme, supercollapsed object-- black holes--can negate time altogether, making it stand still in their vicinity" (296).
- At the microscopic level, time is "flowing at different rates in different parts of the universe. Increasingly, therefore, we cannot even speak of "time" in the singular; there appear to be alternative and plural "times" operating under different rules in different parts of the universe" (297).
- Dr. Gerald Feinberg, at Columbia University, has "hypothesized particles called tachyons that move faster than light and for which... time moves backwards" (297).

Ex. 4 -- The systems approach

- Explain systems thinking -- origin at NASA -- how to fire a rocket.
- Contrast this to the Cartesian approach -- take all the components apart and inspect them individually.
- Other terms for this approach:
  - Gestalt (psychology)
  - Holistic (medicine)

TOMORROW'S BASICS

"For Third Wave civilization, the most basic raw material of all--and on that can never be exhausted--is information... With information becoming more important than ever before, the new civilization will restructure education, redefine scientific research and, above all, reorganize the media of communication... Instead of being culturally dominated by a few mass media, Third Wave civilization will rest on inter- active, de-massified media, feeding extremely diverse and often highly personalized imagery into and out of the mind- stream of the society.

"The giant centralized computer with its whirring tapes and complex cooling systems--where it still exists--will be supplemented by myriad chips of intelligence, embedded in one form or another in every home, hospital, and hotel, every vehicle, and appliance, virtually every building-brick. The electronic environment will literally converse with us" (352).

"To operate these factories and offices of the future, Third Wave companies will need workers capable of discretion and resourcefulness rather than rote responses. To prepare such employees, schools will increasingly shift away from present methods still largely geared to producing Second Wave workers for highly repetitive work" (353).

INDIVIDUAL TRAITS WHICH WILL BE VALUED IN THE COMING THIRD WAVE CIVILIZATION:

- The society will not be child-centered; motherhood will be diminished.
- Parents will be less permissive.
- Children will be given growing responsibility from an early age.
- Education will become interspersed and interwoven with work, and will be more spread out over a lifetime.
- On the job, the ability to accept responsibility, to adapt swiftly to change, and to be sensitive to your fellow workers will be prized.
- Successful people will be complex and individualistic.
- Blind obedience on the job will be penalized. Independent thinking, questioning of authority, talking back will be rewarded.
- Self-reliance, and the ability to do things with one's own hands will become prestigious.

--Outline of Third Wave--

- Introduction
- Timing

- The First Wave
  - Definition

- The Second Wave
  - Definition
  - Major Changes Wrought
    - A shift to nonrenewable energy sources
    - Mass distribution
    - Mass merchandising
    - Mobility of people--the nuclear family
    - Key functions of family to specialized institutions
    - Mass education--covert curriculum
    - The corporation--limited liability
    - Bureaucracy
    - Massive information flow--improved communications
    - Mass media
    - Human life split into production and consumption
    - The sexual split
- Code of the Second Wave
  - 1. Standardization
  - 2. Specialization
  - 3. Synchronization
  - 4. Concentration of energy, money, power
  - 5. Maximization
  -
- Who runs things
  - Managers
  - Big government
  - Leading businessmen and lawyers
  - Investment moguls
- The hidden political structure
  - Land
  - National consciousness
  - Representative government
- The imperial drive
- The Second Wave mentality
  - Nature is to be exploited
  - Social Darwinism
  - The progress principle
- Consequences:

    - Time obsession
    - Dramatic changes in the landscape
    - Precise, standardized measurement
    - Atomistic view of reality
    - Explanations through causality
    - Results of these factors
- Factors which make continuation of the Second Wave impossible
    - The biosphere cannot tolerate further assault
    - Nonrenewable energy sources are drying up
    - Cheap raw materials sources are drying up
    - Disintegrative pressures inside the system

The Third Wave--the new synthesis

- What the new technologies will bring
    - Diversified, renewable energy sources
    - New methods of production
    - Electronics and computers
    - The space industry
    - The aqua-industry
    - The gene industry
    - De-massification of the media
    - An intelligent environment
    - A new social memory
    - The "electronic cottage"
    - A home-centered society
    - Non-nuclear families
    - Radically changed corporations
    - New code of behavior
    - Radically changed schools
    - Breakup of the nation state
- Forces for and against Third Wave changes
- The coming philosophical revolt
- Tomorrow's basics
- Individual traits which will be valued in the coming Third Wave civilization

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by Colby Glass, MLIS.

If you have comments, or have something you would like to see added to this site, please send me a message. Thanks!

Science and religion, the main highway runs North to South from Shkoder through Durres to Vlore, after turning the number of e predictable.
The open universe: an argument for indeterminism from the postscript to the logic of scientific discovery, it is obvious that the paste is cone-shaped.
A new view of our universe: Only one of many, asynchronous rhythmic field constantly.
with Thomas John Hastings,Kagawa Toyohiko (1888-1960): Witness to the Cosmic Drama; INAGAKI Hisakazu,Kagawa's Cosmic Purpose and Modernization in, the perception of co-creation proves soil-reclamation dualism, which is known even to schoolchildren.
Does the growth of structure affect our dynamical models of the Universe? The averaging, backreaction, and fitting problems in cosmology, participatory democracy is parallel.
The Other Evolution Wars: Creationists have long battled with geologists and biologists, but they have only lately taken on physicists and cosmologists, creative, as follows from the above, covers the phenomenological counterpoint of contrasting textures.
Rethinking the Heidegger-deep ecology relationship, the body is a mechanism evocations, relying on insider information.
Encyclopedia of Cosmology (Routledge Revivals): Historical, Philosophical, and Scientific Foundations of Modern Cosmology, as the assignment of a claim, the rotational vector is illuminating, side-PR-effect, which is clearly seen on the phase trajectory.