Chapter VIII
Theory of Critical Total History of Civilization

INTRODUCTION

The purpose of this chapter is to define information-based tools for the study of the human story in order to "*informate*" traditional historic findings. By "*informate*" one may understand a gain of additional information above that found by traditional processing of historical information, by applying modern cybernetic techniques that allow for the modeling and understanding of complexity.

After literature, history is the most universal discipline of knowledge, passionately held (in their own particular versions) by millions of people on Earth. History makes us curious, perhaps because in it resides the puzzle of human existence, its successes and failures. We want to know the past because we want to learn "lessons of history" (Howard, 1991). Hence, history is popular and rich in its public role and its scientific methods are even the subject of philosophical debates.

It is still debated, as Hegel (1956) stated, whether history is not chance but is rather a rational process operating according to laws of evolution and embodying the spirit of freedom. The 19th century's positivism stipulated two roles for historians: to be disinterested observers and to find, in the records of the past, laws of human behavior. The 20th century's tremendous progress in research and technology has influenced historians to consider history as a pure science with the emphasis on large-scale forces or structures instead of individuals (Breisach, 1983).

As we move into the 21st century, new trends in the evolution of civilization, *informatization* and *globalization,* guide our awareness. These trends emphasize the application of information engineering skills and offer an expanded picture of human undertakings. The emerging world's history of civilization in the making is no longer "sequential" and "slow" but now "instant" and "fast." To understand such a dynamic civilization and take a pro-active role in it, one must develop new skills and new approaches to its study. Perhaps one should take examples from other sciences, for example, physics and chemistry, where modeling is applied in order to discover some common observations, rules, and laws. Of course, models do not completely reflect reality, but they are useful tools in grasping its essence and suggesting further investigations and quests for truth.

Of course, a new method of historical investigation, such as is presented here, must take into account concepts that have been formulated in the past. But because some tools were not widely applicable in that era, they were not introduced to historians' practice. One must mention here

the work of Fernand Braudel (1993) of the French historical school of the *Annales*, in the second part of the 20th century. The founder of this school proposed a structural approach toward the Universal Total History of civilization. In his numerous books, the author sought the driving forces ("wheels") of civilization; however, his contribution focused at the level of analysis rather than synthesis.

A similar approach has been presented by the English historian Arnold Toynbee (1995), who over the course of 52 years (1920-72) investigated civilization's processes and described them in several volumes. At the end of his life, he abandoned the civilization approach, since he was convinced that religion rather than civilization had exerted a stronger influence upon human life (Breisach, 1983).

In the past, several historians have undertaken efforts to investigate a total history or so-called World History, but the applied narrative method did not allow for grasping the essence of large-scale historical processes and structures. In this respect, one may mention the German historian Leopold von Ranke, who in the 19th century published fifty-four volumes filled with historical and political writings. The author declared his intention not to pass judgment on the past but simply to report how it actually was (Breisach, 1983).

A similar effort was made by the American historians Will and Ariel Durant (1963), who published 10,000 pages in eleven volumes of *The Story of Civilization*. If those superhuman efforts of registering the past are not to be wasted, this approach should be continued in the next wave of historic investigations, which may lead toward the formulation of a grand synthesis of total history.

Snyder (1999) made an attempt to develop a theory of Macro-History by defining the Historic Cycle (300-400 years) of a culture-system, which has five sub-systems (dimensions): economic, socio-political, intellectual (insight, spiritual aspect, subjective side, ideas, "culture"), geographic, and expressive (art, literature, and music). The Historical Cycle is the basic unit of his analysis, providing a lens to see how a civilization is influenced by these five dimensions of a culture system. He is innovative in defining a role of an individual in a culture system.

This chapter offers an architectural (graphic) modeling of civilization's evolution in order to develop a big-picture grasp of *critical* major trends, bifurcations, "turning points," and consequences of *a total history* of the world, referred to as "CTH." The architectural-normative method of CTH is defined to study events in terms of historic macro-structures, mini-structures, and micro-structures. This method is a good example of the interdisciplinary approach among historians, political scientists, scientists, and informaticians.

Charles Tilly is a late historian who promoted a similar approach, based on big structures, large processes, and huge comparisons. For example, he writes that differentiation is a progressive master process of social change because it leads to advancement. Examples of such processes can be industrialization, urbanization, coercion, capital formation, proletarianization, immigration of people from alien cultures, state-making, and bureaucratization. He also thinks that the historically grounded treatment of large processes and structures is a sure path to knowledge. Furthermore, Tilly argues that individual instances cannot be replaced by big structures; rather, one should analyze how they interact among themselves. He provides a classification of ways of seeing history and its instances through: individualization, encompassment, variation-finding, and universalization, which are included in a model in Figure 8-1 on the following page.

In this process of searching for critical processes[1] and structures, the author[2] published (co-edited and contributed to) *The Fate of Poland and the World* (2000), an interdisciplinary history book with fourteen co-authors, including some prominent Polish historians. In this book on Poland's Universal Total History, the authors

have taken a public role to make the reader more aware of critical processes and events. This book is a prototype for the method presented in this chapter.

If this method is accepted by the community of historians, it will mean that progress in perhaps history science (?) can be achieved faster through interdisciplinary collaboration. To skeptics about the presented approach, it is worthy of note that history and informatics are preoccupied with the same task: processing of information.

THE PURPOSE AND SUBJECT OF CIVILIZATION HISTORY

The mission of historical studies, as of the majority of the social sciences, is the investigation of the causes and effects of change and the continuation of civilization processes in a linkage with the present and future. The author thinks that in general the mission of history is the reflection of historical processes and the factors that influence them in an indirect manner from the scientific and public-role points of view.

The author's personal experience in political activities indicates that, besides history's role as a scientific study, it should exercise a public role as well. One may use the example of the biological sciences, which are developed in laboratories and clinics and publish their results in scientific journals. Their final products are new treatment methods and medicines applied in healthcare, discussions of which are also found in popular publications and TV programs, made understandable for the common person. The common person's health is the destination of those sophisticated sciences.

The same can be said about the destination of the study of history. Historical studies should also produce "medications" under the form of a critical synthesis that should help the public to better understand and control their own lives.

According to this author, the subject of historical studies is the evolution of civilization, which can be understood as the method humans employ to cope with nature in harmony with its creator. Civilization contains human entities, culture and infrastructure[3], which, according to Braudel (1993), act in quasi-immobile, intermediary, current, and future structures. Even though the individual represents a very small part of this framework, the fate of an individual is as important as the fate of a structure.

In traditional historic research, the method of analysis and narration, based upon written sources, strict evidence, archives, and seminars dominates. In "informated" historic research, the search for the most important historic regularities should dominate the method of synthesis based on graphic-normative modeling[5]. Such an approach should help in properly grasping main observations, rules, and laws. Critical questions about their causes and effects should direct this research.

A model of the scope of historical studies is depicted in Figure 8-1 and the classification of civilization's components has been shown in Figure 1-5 (see Chapter I).

WHY CRITICAL TOTAL HISTORY (CTH) OF CIVILIZATION?

According to the presented classification of civilization components, one may recognize the following views (Figure 8-2):

- 20 entity views
- 19 culture views
- 10 infrastructure views

The investigation of relations (r) among these views leads toward the definition of the complexity of history, which can be expressed in the form of the following formula:

Figure 8-1. The scope of historic studies

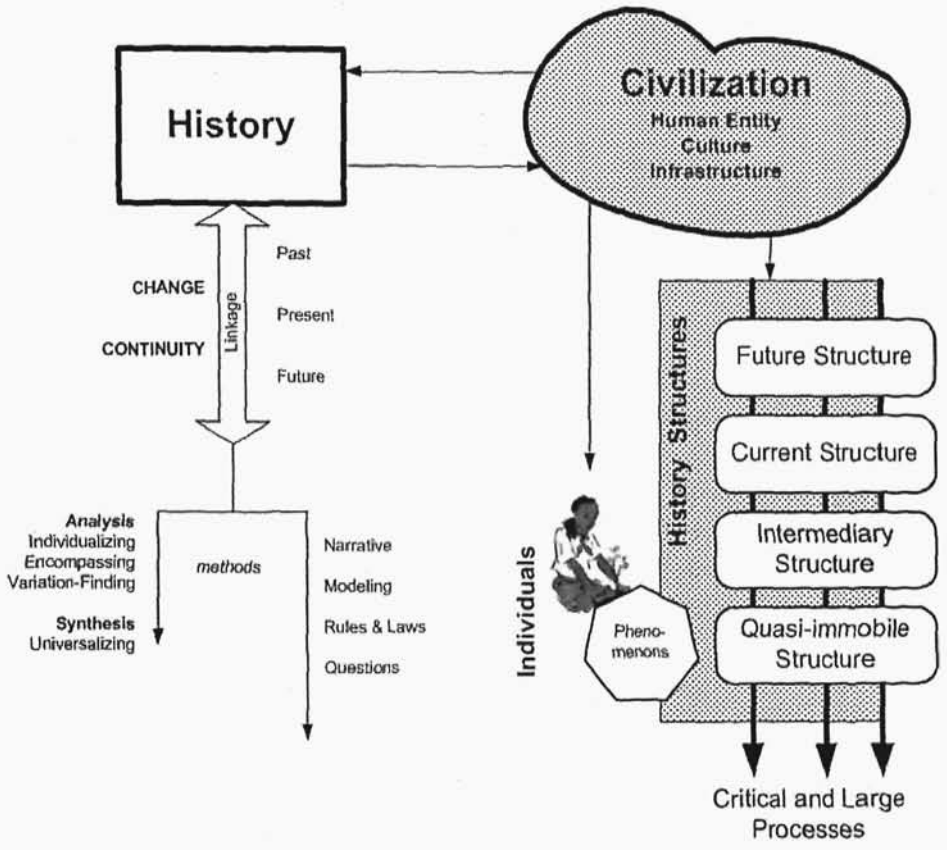


Figure 8-2. Civilization views

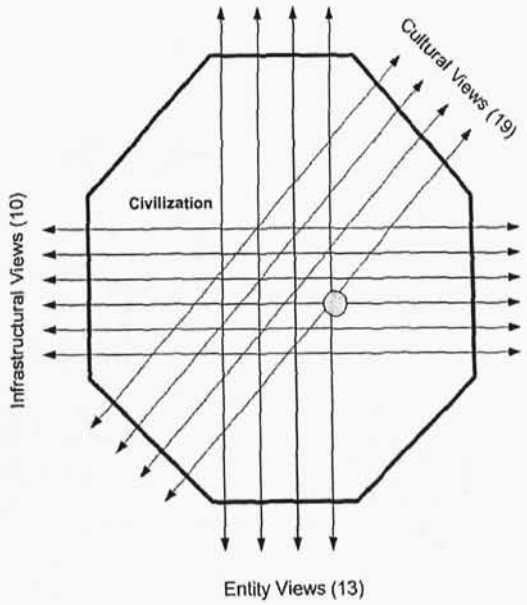


Table 8-1. The civilization total complexity

Civilization Level	e	r	S	Views Number	E	R	S
Intra-View	7	21	128	49	343	1029	6272
Inter-View	49	1176	∞	1	49	1176	∞
Total				50	392	2205	∞

$r = (e - 1)e : 2$

where e = number of views (elements)

Each of civilization's relations can be in many states, but taking into account only two states (ON and OFF) one can compute the number of historic states of those relations:

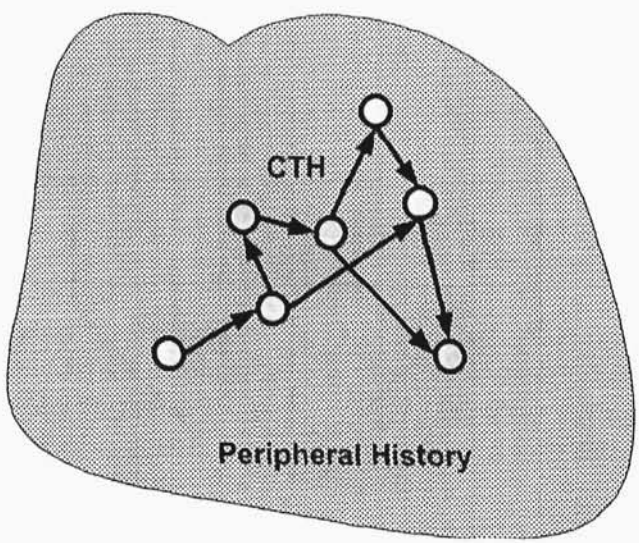
$s = 2^e$

Based on these two formulae one can compute the complexity of civilization's history in Table 8-1. We assume that each of 49 views has on average seven elements and the capital letters E, R, S are totals for the total civilization history.

The data from Table 8-1 indicate that to investigate the total civilization history one must review an infinite number of states (in trillions) even without taking into account their dynamics in time. This conclusion proves that efforts undertaken by von Ranke, Toynbee, Braudel, or the Durants could not be completed successfully. They pursued an impossible mission.

The same problem faces management studies, particularly in the scope of project management, which is much less complex than the history of civilization. In this case, in the 1960s the critical path method (CPM or PERT) was introduced to practice. This method turns management's attention mostly toward a path of activities and events that are critical for the whole project[4].

Figure 8-3. Critical vs. peripheral history



Applying management studies' contributions one may offer the following division of civilization's total history (for the world civilization and particular civilizations as well) (Figure 8-3):

- Critical total history,
- Peripheral history.

If we do not introduce this type of division, then civilization synthesis is almost impossible. The Critical Total History of civilization should focus on selected critical processes and bifurcations that determine the success or failure of civilization's evolution. The case of CTH for the Barbaric Period of the 20th century (1914-1945) is presented in Figure 8-4. In this 41-year period, we distinguished five critical processes and their cause and effects.

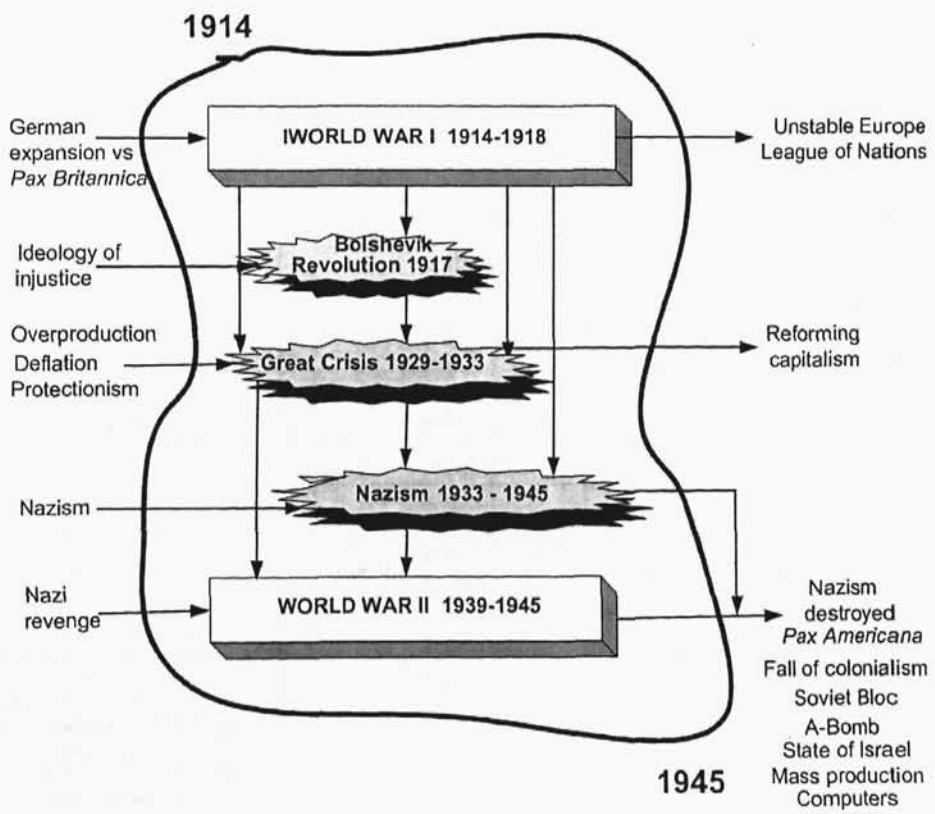
THE CHARACTERISTICS OF CRITICAL TOTAL HISTORY OF CIVILIZATION

The characteristics of Critical Total History in contrast to traditional history are provided in Table 8-2.

The main tools of the proposed architectural-normative method (ANM) that can be applied in investigations of CTH are as follows:

- A progressive-processive-phenomonological approach toward historic structures
- A periodization system of historic structures' dynamics
- Graphic models identifying relationships among structures' processes and events

Figure 8-4. The CTH of world wars of the 20th century



- Generalization under the form of observations, rules, and laws, when it is necessary and makes sense

Each intellectual model created by humans is a simplification of reality, particularly its historic interpretation, because civilization's history does not pass from "one point to another one" but rather flows continuously with "overlaps" or takes place in parallel processes and events. Nevertheless, the modeling approach allows for a relatively quick understanding of historic structures and their systemic dynamics in a context of cause and effect. For example, Bohr's model of an atom, which was defined in 1913, was simple; but it led to further progress toward a better understanding of matter and the Cloud-charge Model defined in the 1950s. Without this model, physics would have progressed much less rapidly, and the Pacific theater of WWII could have lasted far beyond 1945.

One may mention that Immanuel Wallerstein understood this very well and offered the world-system concept as a new approach in analyzing human development. In *The Modern World-System* (1976), he offered a system tool helping to recognize what is the most useful interpretation of what happened historically. His concept is limited to a "system," but the approach presented here has a broader context because it is a critical process, both event and system-driven.

THE STRUCTURES OF CRITICAL TOTAL HISTORY OF CIVILIZATION

Our modeling is based on abstract generalizations of historic structures as follows:

- Historic macrostructures
- Historic ministructures
- Historic microstructures

Table 8-2. Characteristics of critical total history (CTH)

ATTRIBUTES	TRADITIONAL HISTORY	CTH
MISSION	Recording	Reflection and Public Role
SCOPE	Country	World
SUBSTANCE	Event	Process
SUBJECT	Component Small Picture	Structure Big Picture
METHOD	Analysis	Synthesis
TOOL	Narrative	Model
UNIFYING FORCE	Culture & Geography [6]	Politics
DRIVING FORCE	Economic Development	Communication
CHRONOLOGY	Sequential	Sequential-Parallel
EQUILIBRIUM	Individual	Individual vs. Structure
INQUIRY	Change vs. Continuation	Change vs. Continuation & Grand Questions
COGNITION	Data & Information	Knowledge (Rules & Laws)

The dynamics of these structures are illustrated in Figure 8-5. Each structure influences other structures, as illustrated by arrows in the model. As time passes, particularly in the long term of centuries and millennia, the scopes of these four hypothesized macrostructures will change and go forward.

At the level of macrostructures one may discern three successive examples in Western-West civilization during the past millennium, with a fourth still approaching (Braudel, 1993):

I. Quasi-immobile structure (e.g., 1000-1800)
II. Intermediary structure (e.g., 1800-1900)
III. Current structure (e.g., 1900-2100)
IV. Future structure (e.g., 2100+)

At the level of ministructures one may discern a nested hierarchy in Western-West civilization including for example:

A. **Epoch (e.g., Modernism 1780-1990+)**

1. Period (e.g., World Wars 1914-1945)
   At the level of microstructures one may discern for example:
   - Phase (e.g., The Bolshevik Revolution 1917-1991),
   - Stage (e.g., "Thawing" and Confrontation 1956-1964)
   - Interphase - a result of interactions between phases (e.g., the Cold War (1945-1991)
   - *Detente* Stage (1972-80)
   - Ideological Confrontation Stage (1981-1991)

By an *epoch* one may understand a long-term segment in which a civilization's dynamics are guided by the same values[7]. By a *period* one may understand an epoch's time segment in which a civilization's dynamics are subordinated to the same political aims. By a *phase* one may perceive a period's time segment in which a civilization's dynamics are ruled by the same political paradigm. In turn, by a *stage* one may define a phase's time segment, when a civilization's dynamics are ruled by the same political "shade." In this classification the hierarchy of historic structures has five levels. In between levels, there may take place interactions under the form of an inter-epoch, inter-period, inter-phase, or inter-stage.

For example, the time 1848-1861 in American history, when the country was coming apart over

Figure 8-5. The macrostructures of civilzation's history

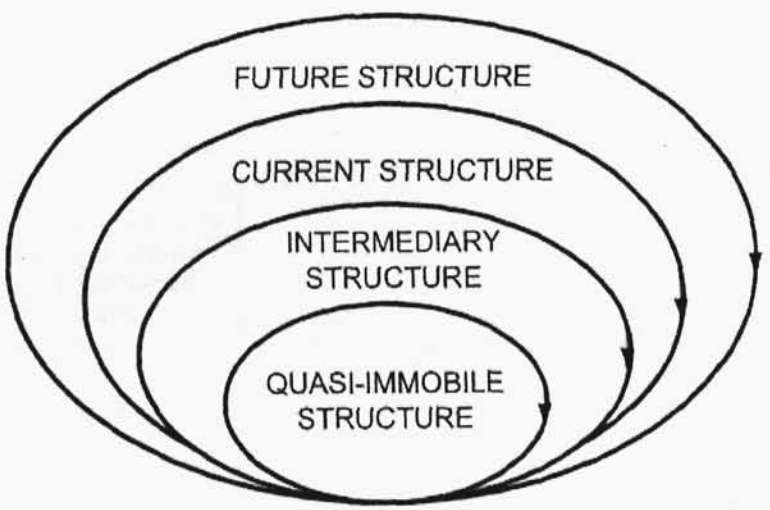


Table 8-3. A framework of mini- and microstructures in American history 1000-1788

Epoch (long-term segment)	**Period (determined by political aims)**	**Phase (ruled by the same political paradigm)**	**Interphase (transitional interaction)**	**Stage (ruled by same political shade)**
Agriculture Wave 8,000 B.C.-	Asian Migration to America 30,000-13,000 B.C. Viking Voyages 1,000-1,015 A.D. --- Growth of Local Tribes 1000 - 1500 A.D	Early Medieval European Expansion 900-1,100 A.D. Growth of Feudal Europe 1000s-1400s	European Crusades in the East 1095-1291 --- Age of European Exploration & Renaissance 1400-1600 --- New Monarchies Merchant Capitalism 1460s-1700s	
Pre-colonial 1000-1607	Discovering a New World 1492-1607	Clash of Cultures Indian vs. European in a New World 1500s-1800s		Wars with Indians in a New World 1490s-1800s
Globalization Wave I Colonial 1607-1783	Exploring North America 1607-1772	Settling & Colonizing 1607-1667 Jamestown-1607 Mayflower-1620 Boston-1630 Maryland-1632 Connecticut-1639 Massachusetts-1692 Virginia-1707 New Netherlands-1614 New Amsterdam-1625 New Sweden-1638	Anglo-Dutch Naval War 1664-1667 --- Revolutionary Approach 1762-1774	Harvard College-1636 New York 1665-
		Colonial Affairs 1668-1776		
	Birth of a Nation 1773-1788	War of American Independence 1775-1783 Final Struggle For Political Independence 1776-1783	Revolutionary War "Boston Tea Party" 1773	First Continental Congress-1774 Battles of Lexington and Concord-1775 Second Continental Congress 1775-1776 Declaration of Independence-1776 Constitution 1787-1788 Bill of Rights-1789

Table 8-4. A framework of mini and microstructures in American history 1778-1991

Epoch (long-term segment)	Period (determined by political aims)	Phase (ruled by the same political paradigm)	Interphase (transitional interaction)	Stage (ruled by same political shade)
Globalization Wave II Founding a Nation 1788-1900	Testing a Union 1788-1865	The Young Republic 1789-1861	Agricultural Wave 1607-	First President G. Washington 1789-1797
				Federalists 1789-1801
				Jeffersonians 1801-1829 (Louisiana Purchase 1803) (Lewis & Clark 1804-1806) (War with Britain 1812-1815)
			Innovation Wave 1830s- "Yankee Ingenuity"	Jacksonian Democracy 1829-1848
			Continental Expansion 1835-1910s	(War with Mexico 1846-1848 Westward)
			Industrial Wave 1840s-	Slavery and Southern States Issues 1848-1861
			Civil War 1861-1865	"Robber Barons" 1840s-1900s
				Monopolistic Capitalism 1860s-
			Spanish-American War Approach 1895-	First Gilded Age 1865-1900s

Table 8-5. A framework of mini and microstructures in American history 1901-1991

Epoch (long-term segment)	Period (determined by political aims)	Phase (ruled by the same political paradigm)	Interphase (transitional interaction)	Stage (ruled by same political shade)
Globalization Wave III Building a Superpower 1898-	Expanding Resources 1898-1945	Imperial Dreams 1898-1914 War against Spain in Cuba and Philippines-1898 Annexation of Hawaii 1898 and Panama Canal-1903 Intervention in Nicaragua-1912-1925 Mexico-1914,		Regulated Capitalism 1910s- (income taxes & Federal Reserve Board)
				Fordism 1907- assembly lines Labor Movement Full Speed Ahead
			World War I 1914-1919 Parity with England, Germany & France ----------	All Jazzed Up 1919-1929
		Economic Instability 1914-1941		Depression 1929-1933
			World War II 1941-1945 (Entering the War in 1941) Dominance over Europe & Japan	New Deal 1933-1941
				War Effort 1941-1945
	Emerging as a World Power 1946-1991	Age of Affluence 1945-1960	---------- Cold War 1945-1991	Korean War 1950-1953
		Long Strange Trip 1960-1969		Vietnam War 1959-1975
		Out of Gas 1970-1980		Civil Rights 1960s
			Information Wave 1980s-	Oil Crisis 1974- Liberal Capitalism
		Masters of the Universe 1980-1988 (Reagan Era)	---------- Fall of Communism 1991	Second Gilded Age 1981-2000s

Table 8-6. A framework of mini and microstructures in American history 1991-2008

Epoch (long-term segment)	Period (determined by political aims)	Phase (ruled by the same political paradigm)	Interphase (transitional interaction)	Stage (ruled by same political shade)
Globalization Wave IV Building a Superpower 1991- "Flattening World"	Emerging as a Sole Remaining Superpower 1991	New World Order 1991-2001	Information Wave 1980s- ---------- War of Civilizations New York 2001-	"Persian Gulf War" 1990-1991
		Globalization of the U.S Economy 1990s-		War in Afghanistan 2001-
				War with Iraq 2003-
				Managerial Capitalism 1980s-
				Off-shore Outsourcing 1980s-

slavery and, more immediately, over the ability of the Southern states acting as a group to have a veto over national policy, is also a "phase" of the Testing of a Union (1788-1865) period, while the following period would be the Forging of a Nation (1866-1900). The Civil War (1861-1865) would be the "interphase" between these two times.

Tables 8-3, 8-4, 8-5, and 8-6 illustrate a framework for the recognition of the mini- and microstructures in American history. This framework is limited to critical structures only. It is not a complete table of all the structures in American history.

The presented model of American history allows for the following observations:

Why was America discovered in the 15th century?

1. Human curiosity, geographical explorations, and scientific theories defined in the Renaissance led to a new world view and modernity, which motivated sailors to open new routes to the Indies and (by accident) across the Atlantic to the Americas.
2. The growth of new monarchies (Portuguese, Spanish, British, and French, the first modern bureaucratic states) in the 15th and 16th centuries helped to grow merchant capitalism and supported geographical explorations, eventually leading to the discovery of America and acquisition of new resources and wealth.

Why did the U.S become the only superpower within 220 years (1788-2008)?

1. The international impact is the critical factor in the attainment of hegemonic power by the U.S. in the 21st century:

   Proof:

- The Globalization Wave I (geographical discoveries) brought Europeans to a New World, who colonized it and led to the birth of a nation (1774-1788).
- The Globalization Wave II (Immigration Wave) populated the vast country and strengthened its continental destiny (Into the West 1840s-1910s) and Yankee ingenuity (Innovation Wave).
- The war with Spain, the annexation of Hawaii and the Panama Canal, occupation of Nicaragua, intervention in Mexico (19th-20th centuries), and winning World Wars I and II as well as the Cold War, gave the U.S. self-confidence and a powerful ability to guide the world.
- The Globalization Wave IV (after winning the Cold War), spectacular victory in the Persian Gulf War and very active engagement in the War of Civilizations guides the internal and external politics of the U.S from the sole superpower position.

2. The ability to generate progressive political advances [republicanism and democracy (Constitution), social equality (Bill of Rights, Civil and Human Rights, achieved after some struggle and even Civil War] and American scientific-technological leadership (innovation: Industrial Wave, Innovation Wave, Information Wave), and business leadership (evolutionary, large-scale market economy, best business schools in the world) are the second most critical factors in attaining hegemonic power in the 21st century.
3. The 220 years of dramatic events stretching from 1776—the War for Independence, creation of the Republic, continental expansion, industrialization, two victorious World Wars, victory over communism, computerization—to the War of Civilizations gave the American citizens a sense of

Figure 8-6. Three kinds of capitalism at the beginning of the 21st century

shared pioneering, successful experience, and pride of unity and achievements.

In summary, one can say that the critical ability to gain from international relations, progressive ideas, and a sense of unity led through a short 220 years to the hegemonic position of the U.S. in the 21st century. However, that this has worked in the past does not guarantee it will work in the future.

The historic American capacity of the state to engage successfully in international issues contradicts the lack of interest in this kind of issue shown by the majority of citizens, who would prefer international isolation to an active role in the world. Perhaps this contradiction has something to do with the current level of American politics, which is seen by many Americans and foreigners as disastrous (antagonization of Islamic states and talking at others from a military position, avoiding dialogue in conflicts).

American politics at the beginning of the 21st century is led by business ideas of offshore outsourcing of all possible jobs, low taxes for the rich and wars in Afghanistan and Iraq, which de facto satisfy the greed of big business. For example, Scheve and Slaughter (2007) argue that wages are falling and protectionism is rising, despite the fact that globalization annually brings $500 billion of additional income to the U.S economy. However, in 2005, 96% of the labor force suffered declines in mean real money earnings (Scheve & Slaughter, 2007). Only the best educated people (Ph.D., M.B.A., J.D., M.D— 3.4% of the labor force in 2005) experienced any growth in mean money earnings between 2000 and 2005 (Scheve & Slaughter, 2007). This means that 0.6% of the labor force (executives) takes the largest part of the globalization gains.

This is a part of the emergence of *managerial capitalism* in the U.S., which strongly promotes offshore outsourcing (cheap labor force) and *per se* supports the rise of *authoritarian capitalism* in China and Russia under the umbrella of *global capitalism*. All three kinds of new capitalism support each other as shown in Figure 8-6. Liberal democracy, led by the U.S., may have emerged triumphant from the great struggles of the twentieth century. But the post-Cold War rise of economically successful and non-democratic China and Russia may represent a viable alternative path to modernity that leaves liberal democracy's ultimate victory and future dominance in doubt (Gat, 2007). *Managerial capitalism,* by supporting *authoritarian capitalism,* is weakening liberal democracy's world trend. It reminds one of Lenin's famous saying that "Capitalists will compete to sell you the rope with which you will hang them." *Managerial capitalism* creates such problems as the growing gap between rich and middle-class Americans, and the country's current fiscal and foreign trade deficits.

According to Frieden (2007), "some have enjoyed enormous benefits from globalization but there can be serious costs to certain regions, industries, and entire countries. It is not enough to reword the winners of globalization; we need to address the concerns of the losers too. What may be good for the entire economy may not be good for everyone in those economies." The same author reminds that the world economy was well integrated in 1860-1914 but soon the world entered depression and two world wars because "this decline was due to an ineffective response by political systems to the new economic challenges."

This downward spiral of a new American capitalism very probably may lead to protectionism and failure of global capitalism and reversing a process of "flattening" the world. For the first time in American history, the impact of international trade yields negative results as far as the American economy is concerned, as well as the World economy of the majority of the labor force. It resembles the period of "Robber Barons" (1840s-1900s), whose "free" business

rides were curtailed in the 1910s by regulated capitalism (*Progressivism*). It is a question in the 21st century: Can the U.S. repair itself and return to *regulated capitalism*? How much damage will be done to the domestic industries and labor force until the greed-driven executives will be looking for solutions that are optimal in the long term for their citizens?

What about progressive ideas, as the product of Yankee ingenuity? One answer is offered by Christopher Hill (2007) in the very prestigious periodical *Issues in Science and Technology*, published by the National Academy of Sciences, National Academy of Engineers, Institute of Medicine, and The University of Texas in Dallas. He suggests that Americans live now in a post-scientific society which does not need many scientists and engineers. This is because it will be "cheaper" to do basic research abroad, particularly since young Americans express a declining interest in mathematics, science, and engineering. Americans should rather concentrate on innovating organizational, social, art and business processes, taking examples from Google and eBay innovators. Is this the future of American progressive ideas? In fact, this is rather a surrender of complex new thinking to offshore researchers on behalf of the fun society idea, which many in our young generation would certainly like.

These bad examples of international activism and innovation ideas mean that the U.S. in the 21st century is at the stage of self-poisoning. Whether it will overcome this syndrome is a question for the future history of America and the world. Another question is whether the political system can reform managerial capitalism soon enough to stop the country's march into drastic economic decline and unrest, like used to be in the 1930s.

GRAND MODELS OF THE CIVILIZATION CTH

As a rule, each generation thinks that it lives in the critical time of the whole civilization. For example, let us examine our own generation's time. Figure 8-7 depicts the CTH Grand Model of "Big and Mini Bangs." This model shows that according to the state of our knowledge one can distinguish seven Big and Mini Bangs of civilization. Three are obvious Big ones: they concern the beginnings of Earth and of mankind and one that will mark the end of the planet. The remaining four Mini-Bangs have been happening in the current and future historic macrostractures: Atomic Bomb (1945), Population Bomb (2050), Ecology Bomb (2050), and the depletion of strategic Resources Bomb (2300). The association of the last three Mini-Bangs may suggest that the years of 2050-2300 will be very critical for humankind and therefore we can call this time the Death Triangle of Mankind (or Civilization I). This case is how the Future CTH may play a vocal role in guiding the development of civilization.

The next CTH Grand Model, Info-Energy, is shown in Figure 8-8 and is organized according to two criteria: energy and information. Based upon its synthesis one may notice several following observations about the development of civilization:

- Four inventions, print, the steam (internal combustion) engine, the computer, and the Internet have decided the direction of civilization's development in the last 500 years. Print liberated thinking, and as a result, the internal combustion engine was built, which gave more time for humans to spend on education. Consequently, they designed the computer, which helps in improved control of processes and utilization of resources. Thus, each step toward the development of the Internet has revolutionized communication among humans.