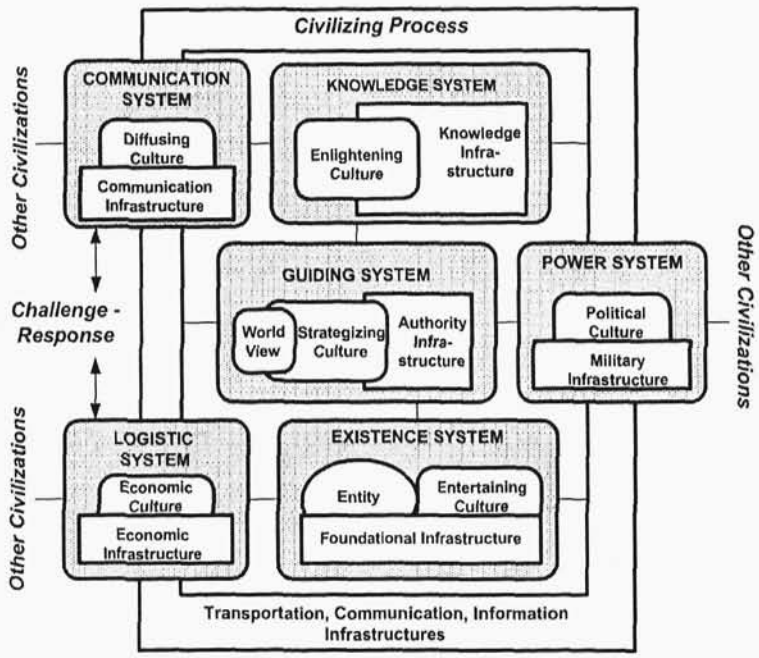
Figure 1-9. A civilization system



Superhighway. It integrates computers, telecommunication, and television into one multimedia channel that allows for the development of electronic commerce, digital knowledge, and national, local, and global information infrastructures. A component-oriented model of an autonomous civilization is shown on Figure 1-9.

THE DYNAMICS OF A CIVILIZATION

Each civilization has a directional function which is reflected in a set of world view values (WVV) as they are provided in Figure 1-10. This set identifies 28 values in five categories of spiritual, ethical, individual existence, collective existence, and justice. These values should be equally interpreted and applied by all (informed to certain degree) members of a given civilization. Of course, a degree of interpreting and applying them differs and depends upon each civilization's character and tradition, including groups and individuals. For example, a set of the Western civilization's WVV is different from the set of the Islamic civilization's WVV. The set of WVV is the central means of the civilization guiding system.

Each civilization has its own dynamics, which determine its behavior. The civilization dynamics are formulated by the scope of interactions among civilization systems. Let us analyze them, looking at the general model of a civilization shown on Figure 1-11.

A civilization is autonomous because it has a guiding system, which through a structure of feedbacks keeps a civilization in functional balance. Thus, an autonomous civilization protects itself by counteractions against factors that could destroy it. An autonomous civilization tends to protect its existence through prophylactic measures against challenges coming from other

Figure 1-10. The world view values set (21st century)

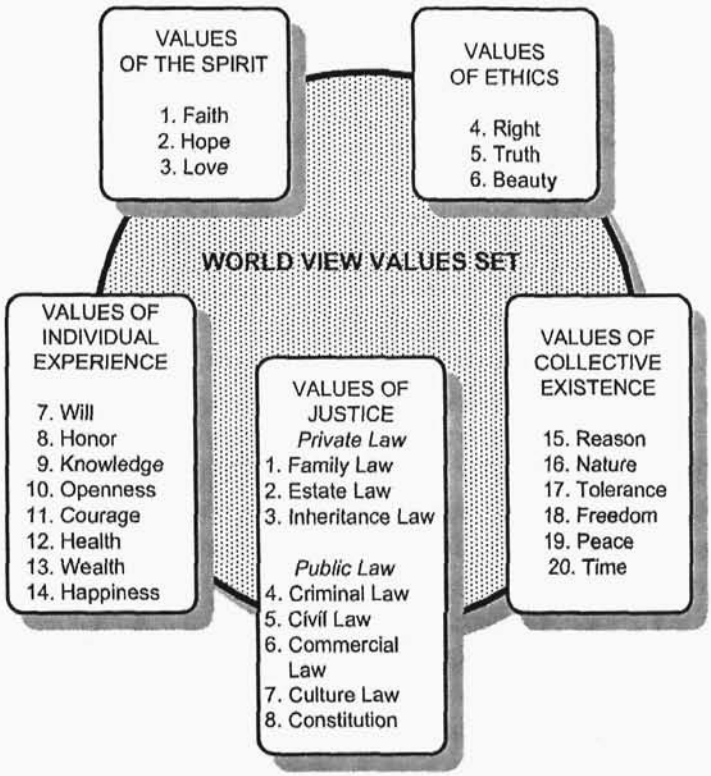
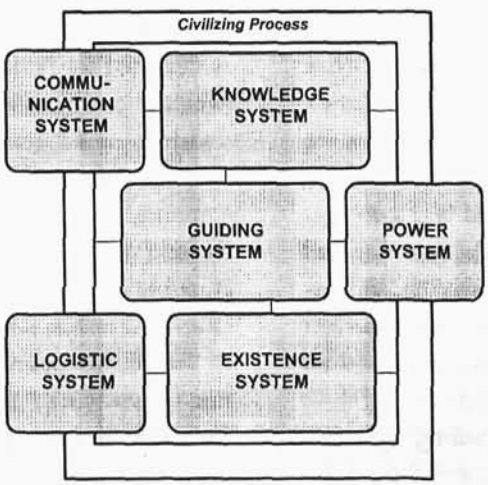


Figure 1-11. A generic civilization system



civilizations and through control of challenges coming from within it. There are two levels of guiding-system involvement. The first is at the level of communicating and informationally interpreting challenges and the second is at the level of registering and interpreting energy-driven challenges of existence.

The first level of civilization operations generates awareness of events and challenges by the knowledge system. The more mature and experienced a knowledge system, the more sophisticated the generated awareness is. Once awareness is passed to the guiding system, it triggers a reflection, which is communicated as a response to the stimulus. Civilizations with a weak guiding system do not generate strong enough reflections (motivations), and then interactions between the communication, knowledge, and power systems reflect a reactional character. This type of behavior is typical for civilizations in decline, such as the Soviet civilization after 1985; this was mostly reactional, without the ability to generate a motivational reflection. However, this civilization could fight (without any awareness of consequences). Moreover, its power system was based on the use of atomic weapons as a reaction to an external threat. Another example is the Eastern civilization in the first millennium A.D., which had a good guiding system with a strong WVV that preferred an alliance with the Turks turban rather than with the Roman miter. If a civilization has a good guiding system, then its response to challenges is of reflectional-reactional character. Such was the case during the Cold War between the Western and Eastern civilizations that had strong guiding systems (NATO and the Warsaw Pact). After 1985, the Eastern civilization had lost its guiding system, and the Cold War was finished in 1991 as the USSR had fallen apart.

The second level of the guiding system's involvement deals with threats coming from the existence system and controls sent to this system. These controls are guided by the reflectional responses of the guiding system. The quality of the existence system depends upon the level of available resources. Every autonomous civilization begins with some level of resources; however, along with its existence this level may decline or rise. If a civilization does not have enough resources, then it begins to search for them in the territories of other civilizations. (This was the case of the Japanese civilization in the first part of the 20th century). As history indicates, the application of the power system (in the war mode) was the main solution in this quest. The stronger power system was used to determine the outcome of the war and the well-being of involved civilizations.

In the quantitative evaluation of a civilization, a cybernetic, generic model invented by a Polish scientist Marian Mazur (1966) is applied. Each autonomous civilization acts in a given resourceful environment that supplies to it external mechanical power (later called "power"), which we will call civilization power (P_c). A civilization cannot take in more power than it can process or more power than there are its needs for total power (P_t). In other words, internal power of civilization (P_{in}) cannot be greater than the civilization power and total power. Otherwise a given autonomous civilization may be destroyed, as it was in the case of the Nazi civilization (1933-1945).

A value of the total power (P_t) of civilizations is depicted in Table 1-2 on a seven-point scale. Western civilization, which is composed of ten cultures, has been divided into four cultural clusters: Western-West (Western Europe, U.S., Canada, Oceania), Western-Central (Central Europe with Poland liberated in 1989, the Czech Republic, Slovakia, and Hungary), Western-Latin (Latin America), and Western-Jewish.

In order to survive, an autonomous civilization must possess at its disposable working power (P_w) for absorption and processing of power taken in from its environment and compensating difficulties associated with it. For example, working power is needed to produce food, housing, and clothes. Without these goods and processes a civilization

Table 1-2. The total power (P_t) of civilizations characterized by level of energy consumption in coal equivalent - kg/capita/year in 1984

Scale Range	Energy Consumption	Civilizations
7	10,000 - 15,000	Western-West
6	7,000 - 9,999	
5	5,000 - 6,999	Western-Central
4	3,000 - 4,999	Japanese, Eastern
3	2,000 - 2,999	Western-Jewish
2	1,000 - 1,999	Islamic
1	Below 1,000	African, Buddhist, Hindu, Chinese, Western-Latin

Source: George Th. Kurian: The New Book of World Rankings, Facts on File Publications: New York, 1984, p. 226.

Table 1-3. Working power (P_w) of civilizations, characterized by average hours per week in manufacturing in 1984

Scale Range	Hours Per Week	Civilizations
7	35 - 39	Western-Jewish
6	40 - 42	Japanese, Western-West, Western-Central
5	43 - 44	
4	45 - 47	Western-Latin
3	48 - 49	Eastern, Buddhist, Islamic,
2	50 - 54	Chinese, African
1	55 - 60	Hindu

Source: George Th. Kurian: The New Book of World Rankings, Facts on File Publications: New York, 1984, p. 248.

could not afford idle power (P_{id}) such as rest, recreation, leisure, healthcare, education, and entertainment, which are needed for the support of operations. Values of working power (P_w) for different civilizations are shown in Table 1-3.

The idle power (P_{id}) of civilizations expressed in the number of cinema seats per 1,000 people is shown in Table 1-4.

Each active civilization must possess at its disposable safeguarding power (P_s). This power compensates for working and idle power. Otherwise working power will dissipate into idle power, limiting civilization operations. The main purpose of empires was the search for safeguarding of power that could secure their long-term existence while maintaining the luxury of idle power possessed by their elites.

Table 1-4. The Idle Power (P_{id}) of civilizations, characterized by the number of cinema seats per 1000 people in 1984

Scale Range	Number of Cinema seats	Civilizations
7	over 100	Eastern
6	60 - 99	Western-Central
5	40 - 59	Western-Jewish
4	25 - 39	Western
3	10 - 24	Buddhist, Western-Latin
2	5 - 9	Japanese, Islamic, Hindu
1	below 5	African, Chinese

Source: George Th. Kurian: The New Book of World Rankings, Facts on File Publications: New York, 1984, p. 403.

A civilization which cannot maintain its necessary level of secured resources will decline into lower stages of existence, but this decline can be arrested. A civilization could also lose its strength and pass into transition or arrest if its idle power (P_i) exceeds its working power (P_w). This is the case for the Roman (31 B.C.-476 A.D.) and Soviet (1917-1991) civilizations. These considerations [3] allow a definition of civilization secured power P_s:

$$P_s = P_w + P_{id} \qquad [1]$$

A relation of the working power to secured power we will call a coefficient of power supply:

$$r = P_w / P_s \qquad [2]$$

Hence, the working power P_w is defined as follows:

$$P_w = r P_s \qquad [3]$$

Inserting the expression [3] into the formula [1] we obtain a formula for secured power:

$$P_s = P_{id} / (1 - r) \qquad [4]$$

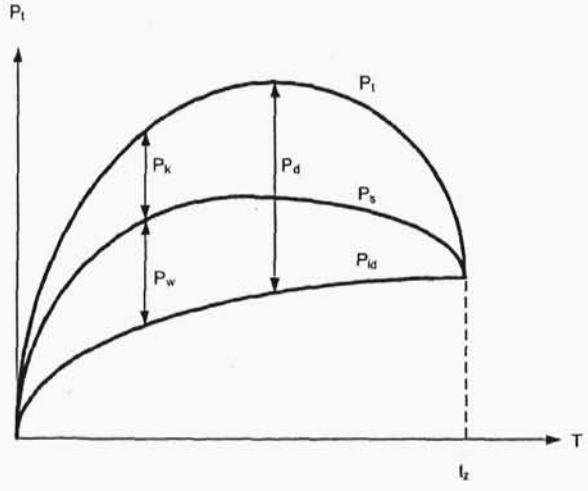
If $r = 0$, the taking in of resources from the environment does not require any work. This means that the existence of a civilization depends upon the size of its secured power which only needs to cover idle power $P_s = P_{id}$. This is the case for the Islamic civilization and its abundant oil resources at the beginning of the 21st century.

The bigger r is, the more work is needed to take in energy from the environment. This means that a civilization must take in more energy and its secured power (P_s) must be bigger.

If r approximates to 1, in other words, when the taking in of energy by a civilization requires vast work, then secured power approximates to infinity. This means that a civilization does not have idle power (P_{id}) regardless of how much secured power it is taking in from the environment. This is the case in arrested civilizations, like the Mayan, Andean, Yucatec-Mexican, Eskimo, Indian and Polynesian specimens. To a certain degree it also represents some parts of the present African civilization.

There is some surplus of power, which remains after total power covers secured power.

Figure 1-12. The distribution of the total power of a civilization, where: P_t - total power, P_{id} - idle power, P_w - working power, P_d - disposable power, P_k - coordination power, P_s - secure power



The remaining power we will call coordination power P_k:

$$P_k = P_t - P_s \qquad [5]$$

Then, the total power P_t of a civilization can be expressed as follows:

$$P_t = P_s + P_k \qquad [6]$$

or if we substitute the expression [1] for P_s then:

$$P_t = P_{id} + P_w + P_k \qquad [7]$$

The disposable power P_d of a civilization is defined as follows:

$$P_d = P_w + P_k \qquad [8]$$

All components of the total power are shown on Figure 1-12.

To survive, a civilization must produce total power no lower than its secured power ($P_t \geq P_s$), which depends upon existing civilization power (P_c). However, a civilization can reduce its secured power (P_s) by triggering changes in the environment that cause civilization power to increase. This means that a civilization may move into a territory with better resources or it may invade another civilization with such resources. This strategy explains the clashes among civilizations. To do so, a civilization must spend some power, which we called coordination power (P_k).

The more coordination power that is at the disposable of a civilization, the more changes it can invoke in the environment. Mastery of information distribution and utilization are at the heart of coordination power, and it produces a positive feedback cycle: more coordination power produces more civilization power, which in turn requires less working power and less secured power. As a result coordination power becomes bigger. This effect means that a civilization reaches its maximal coordination power and civilization power at the same time it has its minimal secured power. This is a highly desirable situation where a civilization uses its coordination power to secure the best environmental conditions, and increases its own existence timeline. In the long

Table 1-5. The Coordination Power (P_k) of civilizations, characterized by the number of computers per 1000 people in 1996

Scale Range	Number of Computers	Civilization
7	301 - 600	Western-West
6	201 - 300	Western-Jewish
5	101 - 200	Japanese
4	21 - 100	Western-Central
3	11 - 20	
2	2 - 10	Eastern, Chinese, Hindu, Buddhist, Western-Latin
1	below 1	African, Islamic

Source: Karen Peteska-Juliussen and Egil Juliussen, 8th Annual Computer Industry Almanac, 1996, 1997 Almanac, Information Please, p. 566.

run, mastery of information increases awareness and knowledge which results in wiser decision making about all civilization system components. Most civilizations last for many years, enduring decisions of varying quality, but information coordination provides capacities to eventually turn data into wisdom for the benefit of a given civilization. Coordination power is characterized by the number of computers per 1,000 people, as it is shown in Table 1-5.

It must be mentioned that along with increased civilization power (P_c), working power (P_w) decreases but idle power (P_{id}) does not decrease. The latter is defined by a civilization's status of aging and development. Therefore, even if civilization power (P_c) could be infinitely great, secured power (P_s) does not decrease to zero, but to the magnitude of idle power (P_{id}). It means that an autonomous civilization increasing civilization power (P_c) may extend its existence (determined by the crossing point of the curve (P_t) with the curve (P_s)) to a value equal to theoretical existence time (defined by the crossing point of the curve (P_t) with the curve (P_{id}))but not to infinity. One can say that the civilization effort to improve external conditions is not the struggle to prolong its existence but rather to avoid shortening it.

In civilizations, the role of civilization power (P_c) involves money, machines, robots that can substitute human work, authority-commanding work force, and so forth. Civilization power can be illustrated at the level of an individual. For example, children have too little disposable power to generate working power and idle power and thus, total power; therefore, they have to rely upon their parents' power to obtain secured power. Also, at the end of human life, disposable power is small, so one can function with the help of civilization power (P_c) such as money, family help, and welfare until the total power (P_t) cannot cover idle power (P_{id}).

Larger coordination power (P_k) improves the chances a civilization has in searching, comparing, digging out, acquiring and shaping the external environment in order to increase civilization power (P_c). We can express this process by defining the autonomy coefficient

$$f = P_k / P_d \qquad [9]$$

which means that with a portion of its power (P_d), a civilization can focus on improvements of external conditions.

Expression [8] indicates that if ($P_w = P_d$) then ($P_k = 0$) and $f = 0$. In other words, if $P_{id} = 0$ a civilization has no flexibility and its behavior is forced. This is the case of African civilization, which was invaded by Islamic and Western civilizations that were looking for slaves.

Another extreme case takes place when working power ($P_w = 0$) is entirely substituted by civilization power (P_c). Then, secured power contains only idle power ($P_s = P_{id}$), coordination power becomes equal to disposable power ($P_k = P_d$) and the autonomy coefficient f = 1. This leads us to the following sequence of relationships: if a civilization has possibly the highest autonomy coefficient, it means that coordination power is possibly highest and it can organize the possibly highest civilization power. In effect, secured power is possibly minimal and a civilization can exist longer than without these conditions. Hence, one can draw the following rule: the bigger the coordination power is, the longer a civilization exists. Coordination power is mastery of information. This rule emphasizes the critical role played by good management techniques and effective information systems in strong Western civilization development during the 20th century.

A CHARACTER OF A CIVILIZATION

With the help of the Mazur General Cybernetic Model (1966), we can describe a character of each civilization. A civilization character can be described by its dynamism (D), developmental coefficient (G), aging coefficient (R) and dynamism coefficient (n=G/R). Based on the values of these coefficients, one can distinguish the following types of civilization character:

A - endodynamic civilization ($G \leq R$, $n \leq 1$, $D \leq 0$), characterized by accelerated development, or,

B - static civilization (G=R, n=1, D=0), characterized by development equal to aging, and/or,

C - exodynamic civilization ($G \geq R$, $n \geq 1$, D =0) characterized by slow downward development.

The coefficient (n) and number (D) characterize a civilization character based upon the flow of total power (P_t) and idle power (P_{id}). In practice, there are smaller differences between civilization characters than between A and B or B and C. Therefore, we will introduce two intermediary classes of civilization character:

AB - endostatic civilization, and
BC - exostatic civilization

Since endodynamic civilizations employ slow development, their characteristics may be identified in the following manner. Slow development means that the guiding system is not intensive and therefore the existence system evolves very slowly. The slow guiding system means that reflection potential is low and awareness generated by the knowledge system is weak. Coordination power (P_k) is low and saved for the eventual increase of civilization power (P_c). This means that the guiding system tolerates challenges and delays and limits its response toward the removal of obstacles only.

The A-class civilizations control themselves toward the *status quo* policy of maintaining civilization power only. Their behavior is reactionary toward challenges. The main factor which increases the power of a member of this class of civilization is the policy of survival, leading to the constant prolongation of existence. Among such civilizations one can classify the Hindu, Buddhist, and African civilizations.

The C-class civilizations have opposite characteristics. Their fast development indicates that the guiding system is intensive and therefore their existence system undertakes fast evolution. Such civilizations have a big disposable power (P_d) and their responses to challenges are strong. Their coordination power (P_k) is also big; therefore, when civilization power (P_c) is declining and secured power (P_s) is growing, total power (P_t) is sufficient to insure that their existence is not threatened. To cover working power (P_w) and secured idle power (P_{id}), civilization power (P_c) does not to have to be increased.

The C-class civilizations orient their life toward the maintenance of big coordination power (P_k), and their responses are mostly directed toward internal challenges. The Spartan, Soviet and Nazi civilizations belong to the C-class.

Comparison of A and C classes of civilizations is provided in Table 1 - 6.

The endodynamic civilizations (A) function according to a doctrine "lasting longer brings longer satisfaction," while exodynamic civilizations (C) prefer a doctrine "living intensively brings more life." The purpose of endodynamic civilizations is to achieve a positive balance of life, while exodynamic civilizations' purpose is to increase participation in life. Static civilizations (B) aim toward a balance between current effects and security for the future. The endodynamic civilizations make decisions based on the criterion "what is effective," while the exodynamic civilizations will based their choice according to the criterion "what is pleasant." Static civilizations prefer the criterion of "what is right" in their decision making. The extreme civilizations do not follow the rules while static civilizations look for moral behavior. The static civilizations' balance between spending and saving leads toward a predilection for order, which very often means "order for the sake of order." Endodynamic civilizations neglect the order if it becomes ineffective, while the exodynamic civilizations disregard order if it is not useful to them.

Endodynamic civilizations organize themselves around moves that increase civilization power in connection with the strategy of extending its life. Therefore, this kind of civilization behaves with reason, carefully calculating measures and looking for consequences in the future. The exodynamic civilizations seek short-term effects, behave in a less reasonable, rather negligent and unsteady manner. The static civilizations assign lasting meaning to principles. Hence they act with confidence and even when it is a doubtful strategy, they continue to believe in their principles, which sometimes look naive to outsiders. The latter is exemplified by the Western civilization's

Table 1-6. Comparison of the A and C classes of civilizations

Endodynamic Civilizations (A)	Exodynamic Civilizations (C)
Slow development	Fast development
Low-intensive guiding system	High-intensive guiding system
Small increments of reflectional potential	Big increments of reflectional potential
Rare responses	Frequent responses
Weak responses	Strong responses
Aspiration toward big civilization power	Aspiration toward big coordination power
Slow removal of obstacles	Fast removal of obstacles
Sensitivity toward changes in the external environment	Sensitivity toward changes in their own existence system
Control upon future results	Control of the current results

approach to the USSR during the Cold War from 1945 to 1991.

With respect to the information and communication infrastructure, the endodynamic civilizations consider information carefully to make decisions about their future. In static civilizations, information is collected and distributed in a limiting manner, since only such information is needed that satisfies the criterion "know only what you should know." The exodynamic civilizations prefer general and "surface" information but they communicate with great confidence and "loudly." They prefer to manipulate information in such a way as suits their purposes.

In terms of admitting successes and failures each class of civilization has its own way of coping. Endodynamic civilizations minimize their successes and exaggerate their failures, since they do not have enough coordination power and civilization power; hence, they always look for ways to increase them. Therefore, they remember what they had in deficit more than what they had in surplus. Also, fearful of competition, they do not want to share with other civilizations the sources of their successes and failures. The exodynamic civilizations, possessing large coordination power, exaggerate their successes and minimize their failures in order to gain stature in the world's opinion. Static civilizations react toward success and failure from the point of view of their lasting principles. They are terrified by big successes and failures, since these events invert their established order.

The comparison of civilization character is illustrated in Table 1-7. This comparison is very general in nature and serves only as a point of departure. The Western-Latin and Islamic civilizations are considered exodynamic since despite coordination power (low computer power), they have strong guiding systems, based either on theocratic or authoritarian principles.

In general, the exodynamic and endodynamic civilizations provide most of the contributions to culture. On the other hand, the static and endostatic civilizations provide most of the solutions in civilization infrastructures. Some endodynamic and endostatic civilizations contribute significantly in so-called philosophies of life.

A MODEL OF THE WORLD CIVILIZATION

Until now we have dealt with the modeling of civilization as it was initiated by Toynbee (1957) and Koneczny (1962). However, presently we are

Table 1-7. The comparison of civilization characters

Endodynamic (A)	Endostatic (AB)	Static (B)	Exostatic (BC)	Exodynamic (C)
Hindu	Chinese	Western-West	Western-Central Western-Jewish	Western-Latin
Buddhist		Japanese	Eastern	Islamic
African				Soviet
				Nazi

changing our point of reference from a civilization or civilizations to the world civilization as it has been perceived by Braudel (1993).

Following Braudel, we assume that the more broad and complete a perspective is, the more accurately we can infer conclusions about the fate of the world from it. In this section, we are going to expand the Braudel model. His four historical macro-structures of the world civilization are modeled into four "wheels" which strongly influence each other in the Braudel-Targowski model presented on Figure 1-13.

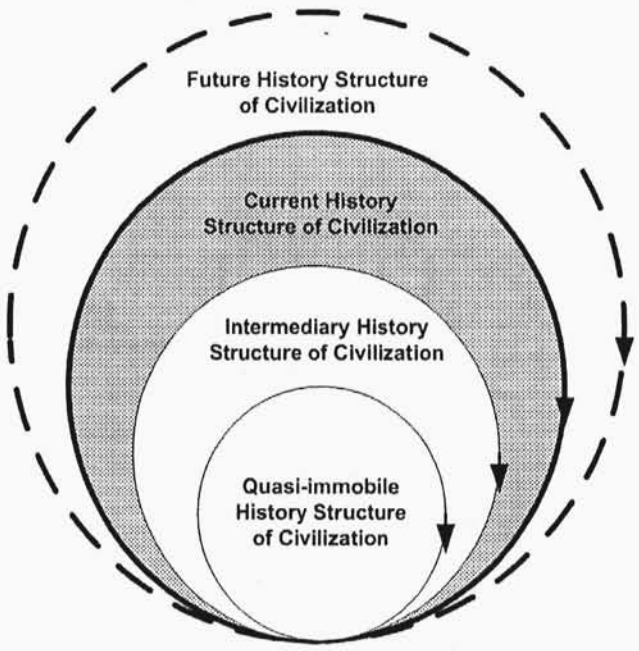
The four macrostructures are defined in the following manner:

A. The quasi-immobile macrostructure of 6,000 years of history of people's civilization with emphasis on the last millennium
B. The intermediary macrostructure of the history of the civilization (epochs, phases, and periods of the 19th and 20th centuries) which bind the most important events in the cause-effect chain
C. The current macrostructure of the history of civilization in which we are functioning now and which is a result of two previous structures that directly influence the future
D. The future macrostructure of the history of civilization, as a sketch of the results of the present structure of civilization. It is a history in *status nascendi*, whether probable or not, whose purpose is to warn us of wrongs or to confirm our good

The model of history macrostructures of civilization (HMoC) in Figure 1-13 illustrates the correlation between different intervals of historical time. By the logic of the arrows in the model, each macrostructure leads to another, both in selection of facts and in interpretation of the past from the point of view of the present.

No one should be surprised, therefore, that the current macrostructure of the history of the civilization implies a quasi-immobile macrostructure. For example, we have changed our opinion about

Figure 1-13. Braudel-Targowski Model of history macrostructures of the world civilization



the Crusades of the 12th and 13th centuries. In the past, they were considered as expeditions to loot the pagans. Contemporarily, we believe that the Crusades had a religious character and the crusaders were genuinely interested in converting the pagans (Riley-Smith, 1995).

Therefore, the logic of the arrows should not cause doubts regarding the dependency of future structures on the previous ones. It is obvious that particular macrostructures of the history of world civilization have a dynamic character. As time goes by, especially periods measured in hundreds and thousands of years, the time scope of these four structures will modify and move foreword along with the calendar.

GRAND LAWS OF THE WORLD CIVILIZATION

The idea of laws of the world civilization history is controversial, especially after an assumption of a developmental course of history. History does not have to repeat itself according to the laws regarding the past. From studies of the fate of the world in the last 6,000 years, which are contained in this book, three rather important laws result:

The First Grand Law of the World Civilization is the Ability of Man to Develop:

People have seen themselves as entering the world with a potential of many gifts, and they hope to fulfill these gifts in the development of their own lives (Bronowski & Mazlish, 1962).

The Second Grand Law of the World Civilization is the Right of Man to Freedom and Reason. We formulate it as follows:

People constantly aim for freedom; the range of this freedom and reason depends on the level of a nation's knowledge, communication ability and knowledge of the international community.

During 6,000 years of civilization, man steadily increased his freedom, to some extent, as an achievement of knowledge about social life. In practice, man was liberated from political, economic and social discrimination by the end of the 20th century, when many dictatorships fell, including Communism and other oppressive regimes. People started to increase their freedom only in the 2nd millennium. Examples of this occurred during the Renaissance when print was widespread and during the beginning of the development of natural sciences. Moveable type and natural science gave birth to the Enlightenment, which created the American Revolution and the French Revolution. This led to democracy, in other words the rule of the people. In the process of the development of knowledge, the Industrial Revolution strengthened democracy by a gradual economic liberation of mankind. Further reinforcement of the development of knowledge is happening during the Information Revolution, which reverses the former human path toward knowledge. During this time, people do not need to seek out the information because the computer networks bring data to them wherever they are.

The Third Grand Law of the World Civilization is the Law of Conscious Historical Evolution, which we formulate in the following way:

Mankind consciously steers the development of civilization through the formulation of main ideas and values in each given epoch.

The Renaissance, the Enlightenment, and Modernism each left a permanent mark on the course of history in their particular periods, phases, and stages. Formulating those ideas or values can often happen in a sharp conflict or even in a social revolution.

The law emphasizes a sphere of conscious culture, which guides the remaining spheres of social life. This way, one pulls out of the "oppression" of the economic field which, according to Karl Marx, justly and solely directs the awareness