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The Element-Based Method of Civilization Study

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andrew.targowski@wmich.edu

Abstract

The purpose: to define the element-based method of studying civilization with a meaningful contribution to contemporary life.

The methodology: the transdisciplinary, big-picture view of human development on Earth based on graphic modeling of civilizational elements, their relations, and dynamics.

The findings: about 200+ civilizational elements have been recognized within about 500 possible elements of society, culture, and infrastructure.

Practical implications: today, civilization infrastructure challenges society and culture, which can lead to the fall of the Homo *sapiens race* and the rise of a human-machine race. Moreover, one of the options will be the rise of designer babies and the dichotomy of our race into traditional people and super healthy people; another option may lead to the labor-free economy and killer robots.

Social implications: to practice sustainable civilization it is necessary to regulate technological progress which conquers our well-being.

Originality: this approach offers an element-based understanding of civilization which is essential for developing wise aims and strategies of wise civilization.

Introduction

The study of civilization is about 150+ years old, marked by the contributions of such pioneers as Nikolay Danilevsky (1822-1885), Fukuzawa Yukichi (1867-1916), Oswald Spengler (1880-1936), Arnold Toynbee (1889-1975), Feliks Koneczny (1862-1949), and Fernand Braudel (1902-1985), plus others. They built the foundation for the study of the concept and role of civilization in the development of the organized humans. After World War II, the study of civilization became more popular and somehow separated from the study of history. Civilization was conceived as a living organism (still showing active signals from the past millennia and centuries) in contrast to history, which is *time passé.*

However, a civilization was perceived by many early scholars as a *large culture* -- mostly or especially by Pitirim Sorokin (1889-1968), Alfred Kroeber (1876-1960), Clyde Kluckhohn (1905-1960), and Lee D. Snyder (1933-2012). On the other hand, there have been recent scholars like Rushton Coulborn (1901-1968) and Carroll Quigley (1910-1977) who looked at a big-picture of civilization's origin and evolution.

Eventually, the study of culture became widely implemented as the academic program, but the study of civilization landed on the waiting list in academia. This resulted in an impressive growth of scholarly research about culture. Since the number of different cultures is large, and there are at least about 100 dominant cultures one can investigate, the new knowledge about them is vast, dispersed and very often limited in conclusions with value for the current societies.

On the other hand, there have been about 26 to 30 (depending on the author) major civilizations, but today there are only about eight or nine major civilizations, as the term will be characterized in this study. Furthermore, the impact of these civilizations on our current lives worldwide is much more aggressive and significant than the impact of some of those cultures.

The International Society for the Comparative Study of Civilizations, since it was formed in 1961, has been filling this gap in studies on culture and civilization. This effort led to the extensive discussion of what is civilization, led by Mathew Melko, David Wilkinson, Steven Blaha, William McGaughey, Laina Farhat-Holzman, Andrew Targowski, and others (Targowski 2009b).

At the beginning of the 21st century the idea of "civilization" becomes more popular as we are facing terrorism, which is *de facto* a war of civilizations. At the same time a concept of a "state" changes, when for the sake of *globalization* some states are ready to minimize their roles and look for to self-supporting citizens and growing business in a world without borders. Both of these factors emphasize the growing role of "civilization" in world affairs. To investigate the current state of affairs successfully a new approach is offered in academia: Big History, which is still time *passé*, but perhaps less polluted with peripheral events and leaders.

Today as we face the deadly clash of civilizations, as defined by Samuel Huntington (1927-2008), a former member of the ISCSC, even the best definition of civilization (or Big History's impact) is not enough to understand why we face that clash while modern warfare (terrorism-driven and cyberwar) is largely unnoticed by most members of society. The contemporary study of civilization reminds us of the state of physics before the Solar Model of the Atom was offered by Rutherford–Bohr in 1913. Their significant solution was in recognizing the dynamics of such particles as the proton and the electron. Today, after 100+ years this two-element model is called the Cloud Model, since it contains about 50 particles and sub-particles, discovered step by step within the past 100+ years. A similar process is taking place in medicine, when in the 19th century "*plasma*" was one solid-state big "*brick*" of the human organism.

Today we know that our bio-system is composed of about 19,000-20,000 protein-coding genes[1] and 23 <u>chromosome</u> pairs in <u>cell nuclei</u> and each gene has a particular function determining our well-being.

The reverse process should take place in the study of civilization. Namely, one must decompose this enormous societal organism, perceived by the majority of researchers as a *solid cloud* into many elements and sub-elements, and then investigate their functions, dynamics, and consequences. This investigation will address the process of recognizing categories of civilization's elements and their functions, leading to research on their dynamics and consequences, for example at the level of the civilization indexes (Targowski 2004 and 2009a:62-74). In this way, one can better understand what the set of critical problems of contemporary civilizations is and what can we expect and how to prevent bad solutions.

The Structure of Civilization

Civilization is an info-material structure developed by humans to cope with themselves, nature, and their creator effectively. It is a vibrant "interface" which differentiates humans from animals (Figure 1).

The concept of "civilization" is applied to a wide diversity of particulars: to the level of religious ideas, to the level of customs, to the level of technology, to the level of manners, to the level of knowledge, and so forth. It can refer to the type of a city, or a relationship between men and women in family, tribe, or society. A type of law and its application reflects civilization also.

The mission of a civilization is to improve human existence. As Toynbee (1995:87) writes: *"The goal of Mankind's continuous and increasing endeavors is still out of sight; we know, nevertheless, what it is."*

What changed our pre-human predecessors into human beings is the attainment of awareness and problem-solving faculties. The cost of human-independent thinking, learning, and a quest for freedom is mental and moral relativity. Hence, the goal of civilization, or in general, of the world civilization, is to minimize "hate" and maximize "love," two opposite forces driving the pulse of human relativity.

The fundamental role of civilization is shown in Figure 1, which reflects in a graphic model the system of the Universe.

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[1] <u>Protein</u>-coding sequences account for only a very small fraction of the genome (approximately 1.5%), and the rest is associated with <u>non-coding RNA</u> molecules, <u>regulatory DNA sequences</u>, <u>LINEs</u>, <u>SINEs</u>, <u>introns</u>, and sequences for which as yet <u>no function</u> has been determined (*International Human Genome Sequencing Consortium (Feb 2001). "Initial sequencing and analysis of the human genome" Nature.* **409** *(6822): 860–921).*

- The universe system is composed of three subsystems: humans, nature (ecosystem), and civilization.
- The creator (God or Big Bang) is the steerer of the universe.
- Relationships among these four components are of two types.
- The first one contains embedded relationships such as A, B, and D, that are somewhat beyond civilizational control, with some exception for sects (e.g., New Age) that define their Gods (the southern direction of the A relation).
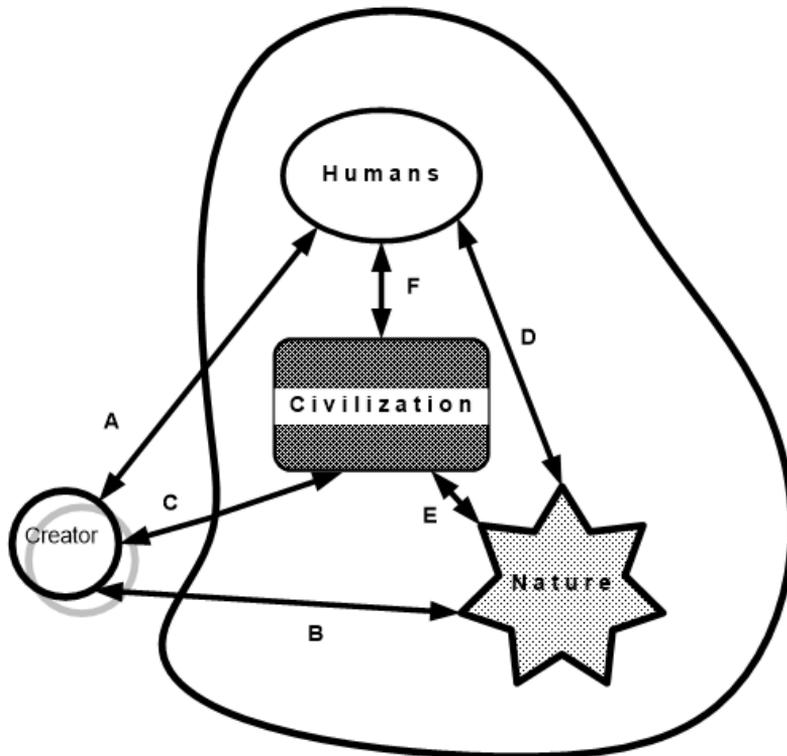- The second type of relationships, such as F, E, and C are controlled by civilization.

Figure 1. The civilization within the universe system

To understand the control function of a civilization one must open the civilizational structure and analyze its purpose, components, and their relationships as it is presented in Figure 2. In civilizational studies, one can recognize so far two approaches to this task. The English, French, and American Mono Element Model (MEM) of the humans' interface treats equally "civilization" and "culture." The German Bi Element Model (BEM) subordinates "*zivilisation*" to "*kultur*."
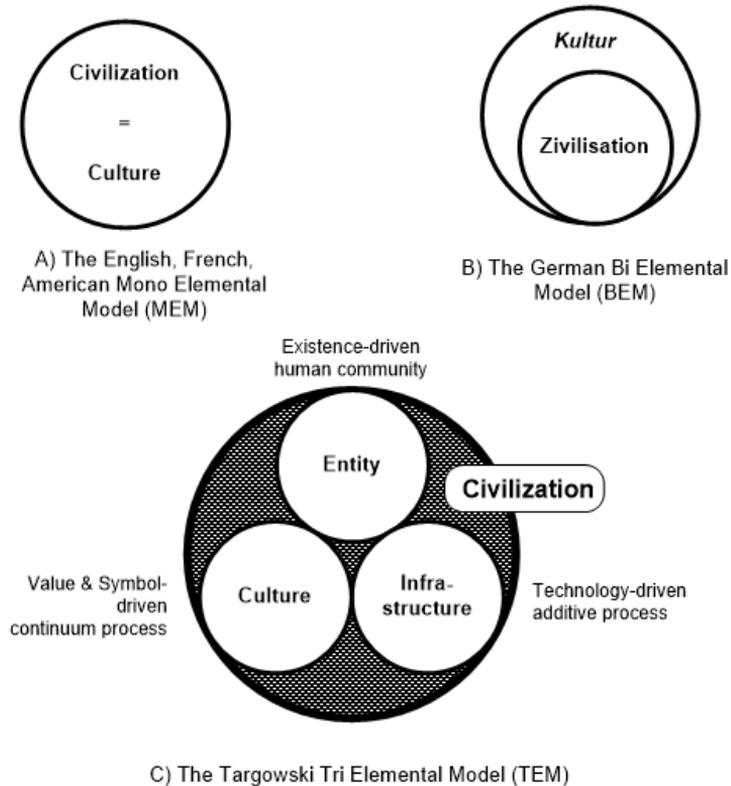
Figure 2. The approaches to defining the structure of civilization

The English-French-American concept of "civilization" contains all aspects of human life: religious, political, social, economic, and cultural. The German concept of "*zivilisation*" is limited to useful things, but only to a value of the second rank. The value of the first rank is "*kultur*" which refers to religious, intellectual, and artistic achievements. The "*kultur*" controls "*zivilization*" and develops it as a continuous motion of material-driven human development. The German concept of "*kultur*" emphasizes differences among nations that may share the same "*zivilisation*."

There is no doubt that the German model is more elaborate than the English-French-American model. However, the German model is still limited, since it does not recognize human entities that determine the whole civilizing process. A new model is needed which could integrate the contributions of these two historic models. The Targowski model recognizes three significant civilization elements:

- **Human Entity** - organized humans in the pursuit of civilization; it is an existence-driven community,
- **Culture** - a value-driven continuous process of developing patterned human behaviors, feelings, and reactions, based on symbols, learning from it and being a product of it,

- **Infrastructure** - a technology-driven additive process of acquiring and applying material means.

In the new Tri-Element Model (TEM), the German concept of "*zivilization*" has been replaced by a concept of an "infrastructure," and the German concept of "*kultur*" has been kept intact only in reference to the infrastructure, since the English-French-American concept of civilization prevails as the developed, holistic, structure of human existence. The third component— the entity—has been included in the concept of civilization.

This model is somehow similar to the Greek model called *Paideia* that unified civilization, culture, tradition, literature, and education, and has been characterized by Jaeger (1945). This approach reflects to a certain degree a civilization concept as a set of wealth, power, and meaning, defined by Arnason (2003).

The 49 empirical components of civilization are categorized and shown in Figure 3. This list is a static model and is, of course, a product of knowledge that we can apply now. In the past, this list would be much shorter. A list-hierarchy of entities requires some explanation. The world civilization began when human individuals organized themselves in a family, tribe, or ethnos.

These entities created prehistoric, primitive civilization, since every human group civilizes itself as it has a purpose, responds to challenges, and applies tools. Toynbee associates the beginning of a civilization with the emergence of a society. We could add that the emerged society triggers the outburst of autonomous civilization and, *sui generis*, the world civilization.

These civilizational components are self-explanatory.   A dynamic model of relationships among these components is a subject of the farther study for those who are interested in this subject. Most of these components have been developed or added along the 6,000 years of civilization history. The most recent components are those which belong to the Integrational Infrastructure and those which are emerging as post-nation entities like the European Union. From the model or ideal type point of view, the presented model's infrastructure dimension allows for a more profound evaluation of the role of technology in civilization.
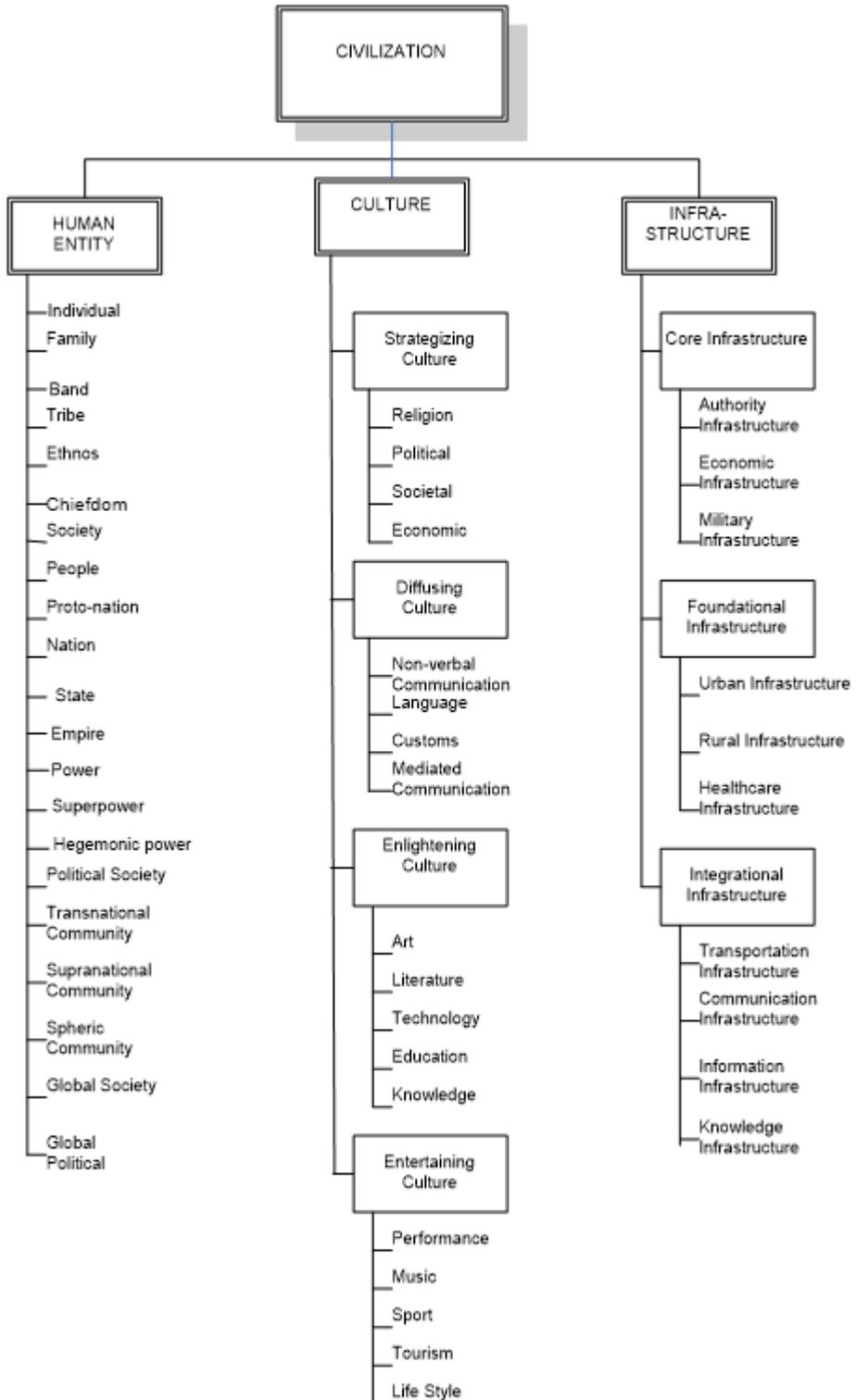
Figure 3.   The three fundamental components of civilization and their essential
subcomponents.

Human Entities and their Dynamics

A human entity is a set of structured relationships among a group of humans that can be organized under several forms, ranging from less to more flexible ones.

A family – a set of parents and children or relations, living together (or not) as the members of a household, serving the needs of the family.

A band – a few dozen people who move continuously in the search for food to survive. They are engaged in a hunting and gathering form of subsistence economy. Bands have informal leaders who may provide guidance.

A tribe – a group of (especially primitive) families or communities, linked together by social, economic, religious, or blood ties, and usually having common customs, dialect, and a recognized, informal leader. A tribe can be considered a segmented society devoted to horticulture or pastoralism rather than hunting and gathering.

An ethnos – a homogeneous community at an early stage of sharing the same culture and awareness of togetherness. It strives for further civilizational development (ex., Incas).

A chiefdom – an autonomous, socio-political unit comprising some villages or communities under the permanent control of a paramount chief with aristocratic ethos, but without formal, legal apparatus of forceful repression, and without the capacity to prevent fission.

A society is an organized group of people on the same territory in order to support their existence through the exchange of specialized, civilizational services. The society shares a common interest and responds to challenges. As a result, society develops its civilizational means. Along with the development of power and economic infrastructures, society transforms into people.

A people is a politically and economically organized society, where one can distinguish a hierarchy of subordinated individuals.

At the beginning of 600 B.C., the Hindu Civilization's people were divided into three classes: priest (*Brahman*), noble warriors (*Kshatriya*), and commonalty (*vaisya*), including both farmers and artisans, augmented by a fourth group, the workers (*sudra*) consisting of non-Aryans.

At the beginning of 400 B.C., the Roman Civilization had people organized into two classes: patricians, who could belong to the Senate and plebeians, or commoners.

The patricians were more prosperous farmers who secured privileges for themselves. Without the access to power, Plebeians became clients to the patricians, who protected them in return for attendance and service.

In the sixteenth and seventeenth centuries, Poland's people were divided into three strata: aristocracy (1%), szlachta (10 %), and plebs (89%).

France organized people in three estates: nobles, clergy, and commons.

Every state or empire had its social hierarchy, one in which people at the top have felt that they were in charge of a state's affairs. The remaining people were oppressed and indifferent to the state's well-being. The force of the civilizing process was coming from a minimal group of people, who were, however, very much interested in the creation of wealth and all means leading to it.

In the 19th century, just after the American Revolution (1775-1783) and French Revolution (1789-99), the concept of a nation began to emerge. A Frenchman and an American no longer served a king but the French or American "nation," (*patrie*). The nation became an entity as a result of a pact between the sovereign people and the state. The nineteenth century is the history of rising nation-states, such as the U.S., Germany, Italy, France, Serbia, Bulgaria, and Romania. In the 20th century, many more nation-states were formed, such as Poland (after 123 years of partitioning), Czechoslovakia (after almost 400 years of Austro-Hungarian rule), Hungary, Yugoslavia, and so forth.

A proto-nation is an entity ruled mostly by an empire. It is an entity that may eventually evolve into a nation. Although this entity is at the stage before a nation, it is a result of the formation of the nation concept.

An example of a proto-nation is Hungary, which self-ruled within the Austro-Hungarian Empire in the 19th century. In the modern sense, Hungary became a nation in 1919, when its state had been established. Czechoslovakia passed through the same process in 1919 and Slovakia in 1995. The fall of Yugoslavia in 1995-97 has the same roots with Slovenia and Croatia creating nation-states.

The disintegration of the USSR in 1991 led to the creation of such nation-states as; Russia, Belarus, Ukraine, Armenia, Georgia, Azerbaijan, Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan, Lithuania, Estonia, Latvia. Proto-nations were Poland, Czechoslovakia, Hungary, Romania, Bulgaria, DDR, and Mongolia under the rule of the Soviet Empire in 1945-89. However, their states did not develop the Polish nation, or the Hungarian nation, since they were promoting the empire's interest which conflicted with these nations' interests.

From the civilizational point of view, proto-nations are *arrested mini* civilizations. Almost 50 years of the Soviet's domination over Central-Eastern Europe led to this process in the region.

A nation is an entity which has a common language, culture, memory of historical events, and "national consciousness." It does not mean that the nation must share a common territory. This condition is applied toward a state rather than toward a nation.

In this model, a state is a category of power infrastructure; however, the state creates the nation. It means that emigrants from the nation-state may claim the origin of their nationality from the nation-state, which may be thousands of miles away. They may say that they belong to the Irish nation, living in the U.S. or even having its citizenship. This new affiliation, however, should mean that an emigrant transforms (voluntarily or involuntarily) him/herself into a member of a new nation since the emigrant is a "subject" of a new state.

The combination of nation-with-state is a strong force, one which drives the civilizing process. The World Wars in the 20th century were experimental ranges for the civilizing process, inspired by strong nationalism, even superiority of one nation-race over another, as was the case of Nazi Germany. The Cold War in 1945-89 was a case of the rivalry between the American nation and the Soviet "nation"-empire. Although the USSR was a federation of tens of proto-nations, it was enforcing continuously the development of the "Soviet" nation, even a *homo sovieticus*." Likewise, the German Democratic Republic was also developing the "GDR" nation.

A state is an autonomous political unit, encompassing many communities within its territory and having a centralized government with the power to draft men and women for war or work, levy and collect taxes, and decree and enforce laws.

An empire is a state of large size exercising political dominion over others, with or without latter's consent.

Power is a state, which is militarily or economically strong. For example, in 2003, China was militarily strong, and Japan was economically strong.

A superpower is a state, which in its military arsenal has atomic bombs and is politically very influential. For example, during the Cold War superpowers were the U.S. and USSR.

A hegemonic power is a state, which dominates the world politically, militarily, economically, and scientifically. For example, at the beginning of the 21st century, the U.S. plays such a role in the world.

Political society is a multi-ethnic entity which evolves from a nation. An excellent example of it is the United States at the end of the 20th century. During WW II the U.S. fought as one nation-state, very proud of its heritage and values. Afterward, along with the development of American democracy, minorities (of all types, including ethnic but mostly race and gender-oriented) evolved into strong interest groups that influenced politics (elections) and led to the transformation of the American nation into the American political society.

This society emphasizes its immigrant roots and uses its services and resources for its segmented aims in disregard of the common interest. In this type of entity, the civilization process is guided by the priority of infrastructure over culture. This society has become very productive but without a sense of how to aim for a meaningful life. The best solution for the U.S. is to sustain its one nation model and prevent fragmentation along the lines of race and gender.

A transnational community is a regional entity, which organizes itself against the challenges of the global economy.

- Examples of this entity type are: the Association of the Eastern Alps, the Celtic Arc, the European Port Cities Network, Working Communities of the Pyrenees, the Rhine Hub including North Rhine - Westphalia, Rhineland-Pfalz, Bayern, Baden-Wurttemberg, Switzerland, Lombardy, and Eastern France (including Burgundy, the Rhone Valley, Cote d'Azur, and Languedoc).
- These centers will rival the centers in America: Montreal-Boston-Philadelphia, Pittsburgh-Detroit-Toronto-Chicago, San Diego-Los Angeles-San Francisco, and Miami-Latin America.
- The Asian regions are emerging around: Tokyo and Osaka, Shanghai-Guangzhou-Hong Kong.
- Changes after the Cold War in Central and Eastern Europe created the following regional communities: Vienna-Budapest-Prague (neo-revival of the Hapsburg Empire), Northeastern Europe: Copenhagen-Hamburg-Szczecin-Gdansk-Klaipeda-Liepaja-Riga-St. Petersburg-Helsinki, and so forth.

The civilization process of this entity type is strong since it is based on voluntary cooperation and respect for either partner's achievements or their potential. Priority is placed upon infrastructure development, however within a shared culture.

The regional community is a very strong force in leveling disproportions of civilizational developments among partners.

A supranational community is a cross-whole-national entity, which removes states' borders in a formal sense and also in the sense of economic and political barriers. An example of this entity type is the European Union (perhaps even NATO) that gradually expands toward a multi-national superstate with the common market, currency, economic policy, and military. This entity's civilizational process leads to the development of a strong common infrastructure, which may lead to the homogenization of cultures.

In a very long perspective, this development may lead to the formation of the political society. At the beginning of 21st century, leaders of EU states have just become aware of it and look for solutions which could prevent the homogenization of national cultures. They would like to guide the EU development by the policy of "unity in diversity." They are aware that the homogenization of cultures leads to lower cultural standards and ultimate vulgarization of existence.

Since the introduction of one legal language in the EU is impossible, it is, therefore, unfeasible to create one European nation. If this is true, the supra-national community must protect different cultures as the prerequisite of a meaningful life. However, this life's comfort depends upon commonly shared infrastructures, which sooner or later will trigger the homogenization of cultures. It is the dilemma of the current EU.

A spheric community is an entity of several nations from the same civilization. Examples of this entity are three states, U.S., Canada, and Mexico that were united by the NAFTA (North American Free Trade Agreement) treaty. The civilizational force of this entity type lies in the area of infrastructural development.

The global society or the society of post-nations is the entity which emerges from the development of a global economy and global culture. It is an entity of stateless and post-national individuals and groups as well as organizations that promote free trade, free flow of ideas and people as a prerequisite of world peace and "happiness." This entity is a strong civilizational force that leads towards the most effective civilizational solutions, particularly in the area of the integrational infrastructure (the Internet, airlines, CNN) as well as its leisure time indulgence culture (Coca-Cola and Nike).

The global political society is an entity that may emerge from global society. An example of this entity is the G-7 or the G-20 group of the most developed nations that promote a common economic policy. G-7 used to be an inter-civilizational group of seven nations plus Russia (from three civilizations), which was included in this Group as an award for the silent accord for the inclusion of Poland, the Czech Republic, and Hungary in NATO. This entity's civilizational power lies in the promotion of global standards of products and services as well as in the promotion of democracy and peace. This action leads toward the modernization of world civilization and the reaction against the Westernization of the world. Both challenges are positive.

Utopia is an entity of calm and stagnation or perhaps even the beginning of civilization death. It seems at first glance that utopia is the desired state of the world civilization; however, it may be just its end.

A civilization can be composed of one or a combination of these human entities, which in the case of the latter is a sort of a configuration of human entities, as Sorokin calls it, a set "*made up of several wholes, halves, and quarters of language, state, religious, economic, territorial groups and unorganized populations*" (Sorokin 1950).

A Structure of Significant Cultures which Shape Civilizational Development

Figure 4 empirically reflects 18 major civilizations and about 100 significant cultures which through 6000 years of civilizational development have been shaping the civilized attitude of humans toward nature, including animals, but also toward the higher order which can be Gods or God or Big Bang.

By culture, one can understand the values and symbol-driven patterned thinking, behavior, and feelings of people and society as well their knowledge/wisdom and skills of applying infrastructural tools to guide the purpose and quality of life to control resources supporting that life.

- The essential element of culture is a religion which controls humans' concept of values and symbols. A person can be theist, agnostic, and atheist.

- Other elements of culture are; education, tradition, science (research, knowledge, and wisdom), art, architecture (as the reflection of the society's image), music, law, politics, governing, food, clothing, relations, and so forth.

However, today it is not enough to investigate a civilization without analyzing its infrastructure.
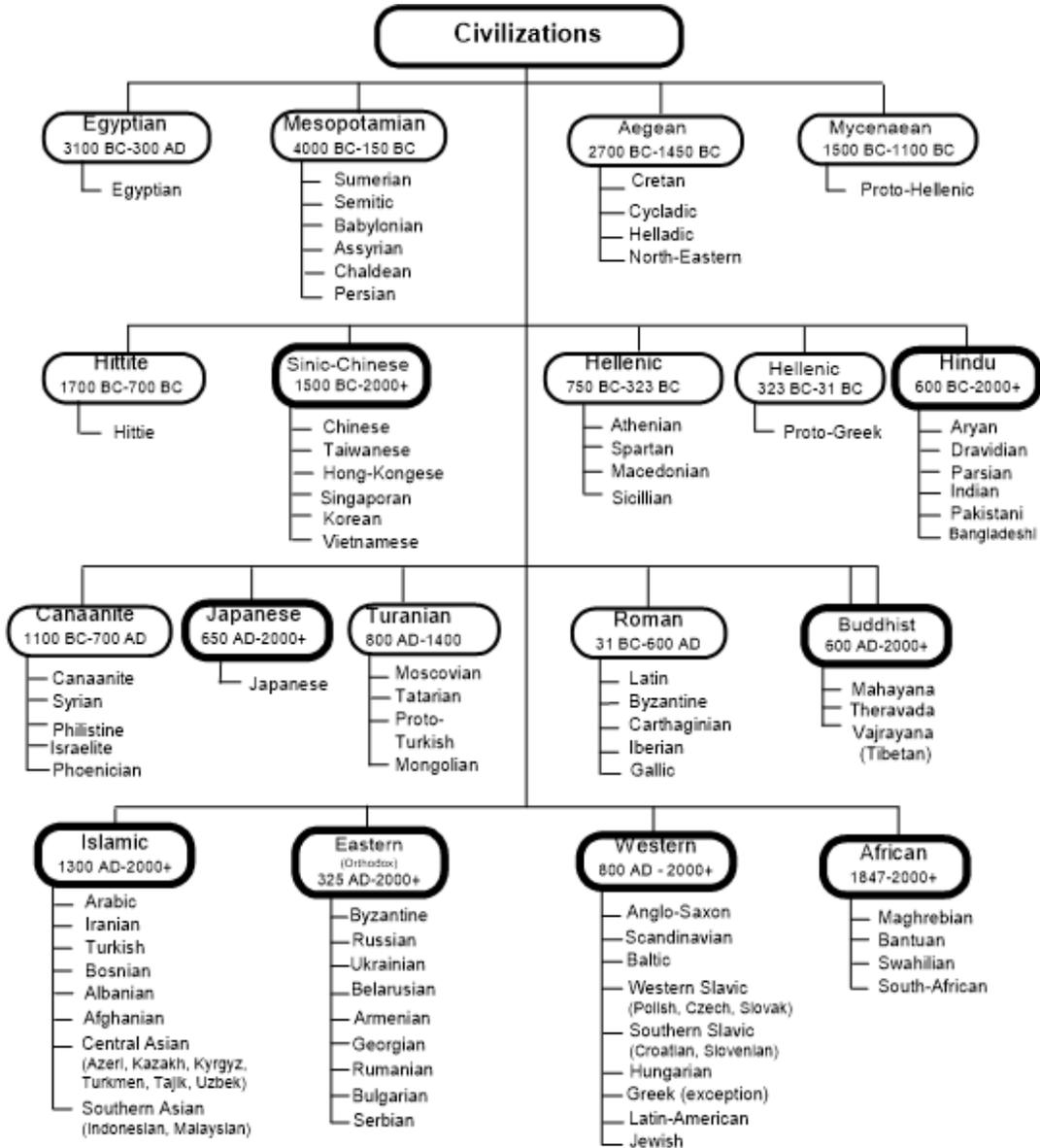
Figure 4. The empirical classification of already developed
civilized cultures of 18 major civilizations

The Structure of Civilizational Infrastructure

The Scientific Revolution of the fifteenth to seventeenth centuries replaced the motionless earth with a "mechanized" one. The universe has ever since been understood as giant machine functioning according to natural and universal laws that could be formulated with mathematical precision. This new worldview inspired the belief that nature could be mastered. There may be some truth to this claim as space travel, including landing on the Moon and Mars, has shown.

Gradually Newtonian science has become the science of Western Civilization as well as the whole world, and its mechanistic paradigm has led to the development of technology in the form of water pumps, engines, automobiles, railroads, and factory systems which characterized the developing Enlightenment (in terms of social mechanisms) and the Industrial Revolution (in terms of mechanical products and processes).

The term "Industrial Revolution" symbolized the shift from an agrarian, handicraft, labor-intensive economy to one dominated by machine-driven manufacturing, specialization of tasks (at the shop-floor and in the office where bureaucracy was born), a free flow of capital, and the concentration of people in the cities of the emerging Industrial Society.

The following legacies of the Industrial Revolution can be perceived from a 200+ year-long perspective (Targowski 2015:109):

1. Factory system and bureaucracy — technological progress in the cotton and iron industries created a factory system based on the engine, which provided centralized power to machines.
2. Railroads — transportation rapidly grew as workers from the countryside had to be taken to the factories in cities via a network of railroads.
3. Steamboats — transportation through seas and oceans was developing fast as the colonies needed products and services, and Europe could provide them but at the same time needed raw materials and free labor (slaves and immigrants).
4. Post Office and telegraph — communication of information was necessary to control the rapid flow of material, products, and services. Royal couriers were found in Ancient Egypt in 2400 BCE. The oldest post office in the world still functioning was opened in England in 1712, and the first telegraphic message was sent from Baltimore, Maryland, to Washington, D.C., in 1844. Very soon, in 1851, a cable was laid down under the English Channel connecting England with continental Europe, and in 1866 the transatlantic cable allowed electric communication between the United States and Europe.
5. Financial system — The West developed a form of stocks for investment in companies with some controlled liability, which allowed for a more effective concentration of capital for savings and investments.
6. Urbanization — concentration of industrial businesses in cities led to their rapid growth. Before industrialization, most workers could grow their food; however, in cramped towns, they had to rely on all sorts of services, which were developing the landscape of those towns. Most of the world's population now lives in cities.
7. Bourgeoisie versus proletariat — a new social structure emerged in the West. According to Marxist theory, this could be characterized as composed of affluent people who are conventional, conservative, or materialistic in outlook

and who own the means of producing wealth, and the exploited working class. The former has organized itself into political parties to defend its economic status, while the latter has organized itself frequently into political parties and international workers organizations to protect its work opportunities and income.

8. Per capita income — since 1820 industrializing world development has been much more dynamic, and more intensive, than in the millennium before. Per capita income rose faster than the growing population; by 1998, it was 8.5 times as high as in 1820 (Maddison 2000:27). This growth created discretionary income which fueled the further development of industrialization and population growth.

9. Population growth — once industry could provide large quantities of products, customers were needed. From 1820 to 1998 the population expanded 5.6 times faster than in the years from 1000 to 1819 (Maddison, 2000:27).

In the 21st century, civilization infrastructure evolved into "Western-Global-Virtual" civilization. As the father of civilization studies, Arnold Toynbee stated (1935) that civilizations respond to challenges of nature and society. He did not mention "infrastructure," since he did not investigate current civilizations in the 21st century, and in those times there were only a few infrastructures, such as authority, military, and rural.

However, in the 21st century, Western civilization became "Technological civilization" dispossessed of culture with a governing soul. Today, "Western-Global-Virtual" civilization functions within many specialized civilizational infrastructures which require responses by its society. These civilization infrastructures are challenging the *modus operandi* in all other cultures including Chinese, Japanese, Hindu, Buddhist, African, Islam, and the newly developing Global culture.

In this investigation I will sketch the global information infrastructures as their model is shown in Figure 5.
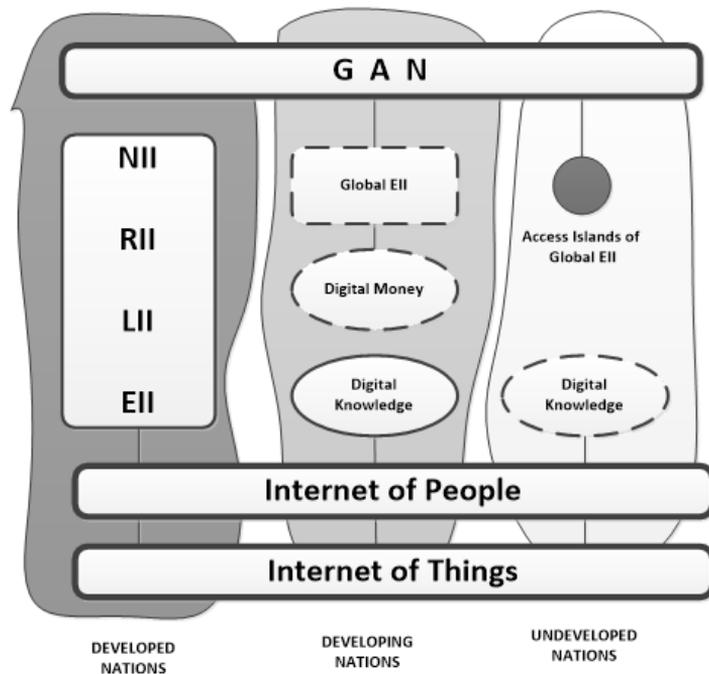
Figure 5. The architecture of the global information infrastructure
in the dawn of the 21st century (EII-Enterprise Information Infrastructure,
LII-Local Information Infrastructure, RII-Rural Information Infrastructure,
and NII-National Information Infrastructure, GAN-Global Area Network-private).

Due to the fast development of such technologies as social networks (Facebook, Twitter, Instagram, Quora and other), artificial intelligence, and genomics[2] — contemporary civilization may be dramatically shifted into human-machine civilization with a new kind of people whose brain will be "e-wired." Why?

- *"Singularity* is near" (Kurtzweil 2005:5,486) which means that we — Homo *sapiens* will be replaced by machine-driven thinking and decision-making species who will be developing human-machine civilization about 25% faster than we do today. It will be done because the humans calculate with a speed of "only" 10^{90} operations per second and our brains automatically interfacing with computers (embedded) will calculate with speed of trillions of operations per second, making of us a new species. Supposedly this range of speed can be available about 2025 according to R. Kurtzweil (2005:125). It will be the second Big Bang in human history, after the first one which took place a few millions of years ago when we had transformed from animals into humans.

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[2] Genomics is an interdisciplinary field of science focusing on the structure, function, evolution, mapping, and editing of genomes. A genome is an organism's complete set of DNA, including all of its genes. In contrast to genetics, which refers to the study of individual genes and their roles in inheritance.

- *Killer robots* are on the horizon, those "who" will kill their masters but before that stage will be active, peaceful robots. They will be designed and planned to:
  - develop a labor-free economy, at least in Western civilization in the very near future, perhaps within ten to fifteen years
  - collect and analyze personal data from social networks and apply artificially made conclusions which will strongly impact our lives (Standage 2018:24)
  - define policies, sentencings, job recruitments and evaluations based on the past information via the extrapolation and repetition of some wrong rules (Standage 2018:24)
  - drive autonomous vehicles (cars, trucks, buses, and so forth) which cannot be reliable 100%
  - implement policing social order and even wars via drones and like machines.

- *Connected online* is half of the world's population in 2018. They eventually can electronically elect presidents and parliamentary members at all levels of society. In this way, representative democracy perhaps will be replaced by direct democracy, possibly leading to societal chaos.

  As the Internet makes people and organizations better informed it also makes them more aggressive under the rubric of hate, cybercrime, and even paid censorship which can spread fake news. For example, in Myanmar Facebook has been manipulated to exaggerate the hatred of the Rohingya minority. In the Philippines, it helped Rodrigo Dutarte, the populist president, get elected. He now uses it to manage an insult crusade against opponents of his bloody war on drugs. In Europe and Northern America, it is used by the terrorists. Before we are ready to regulate world-wide e-communication in society, it will be most likely worse before it is better. Due to our slowness to regulate technology, perhaps it will be too late to "be better."

- *Designer babies* — can be obtained already in 2018, by screening an embryo's genes responsible for specific diseases and behavior. It will lead to genetic editing by replacing unwanted genes with better ones. Those who have money will have a chance to provide their children with solutions supporting a long and healthy life. Eventually, it may lead to the societal dichotomy of society, composed of a higher and lower race. We have seen such an unfortunate approach in Nazi Germany, where *Übermacht* race-oriented politics was in charge of developing the master nation. It failed, luckily.

Nowadays our civilization — as it results from the short list of possible new technology-driven solutions — is impacted rather by the infrastructure than by culture.

Furthermore, it looks that this impact is so rapid, complex, and intense that probably our still "slow" and not the superior, brain is not able to solve the problems challenging us, including even such unlikely outcomes as the replacement of humans by human-machines.

Observations from the Empirical Development of Civilization as Suggesting What to Study

Observation 1: According to Toynbee (1995) the historical development of civilization is driven by physical, societal, cultural (ideological) challenges (paradigms) which are reflected in sets of factors specific for a given developmental stage. Today one must add the technological (infrastructural), global and universal challenges (paradigms) which define civilization.

This sequence of stages indicates only the significant factors in the stimulus-response processes. However, this sequence is inclusive, and the next civilization development's paradigm includes attributes of the previous stages ("civilization additive memory"). This type of dynamic is shown in Figure 6.

Observation 2: Among driving forces of civilization development one can recognize the following:

- Each civilization stage's experience drives the remaining stages. There are endless factors characterizing these stages. To make the study of civilization more focused, one can investigate the inter-stages experiences through the following processes and systems:

  - Nature (climate) and biological evolutions
  - Strategizing culture
  - Info-communication processes
  - World-systems

- The info-communication process is crucial in providing better information flows and communication among humans, first by developing speech, later symbols, papyrus, books, newspapers, telephone, mass-media, computer, and its networks, which lead to higher awareness, more knowledgeable, and perhaps wiser decision-making by civilized humans.
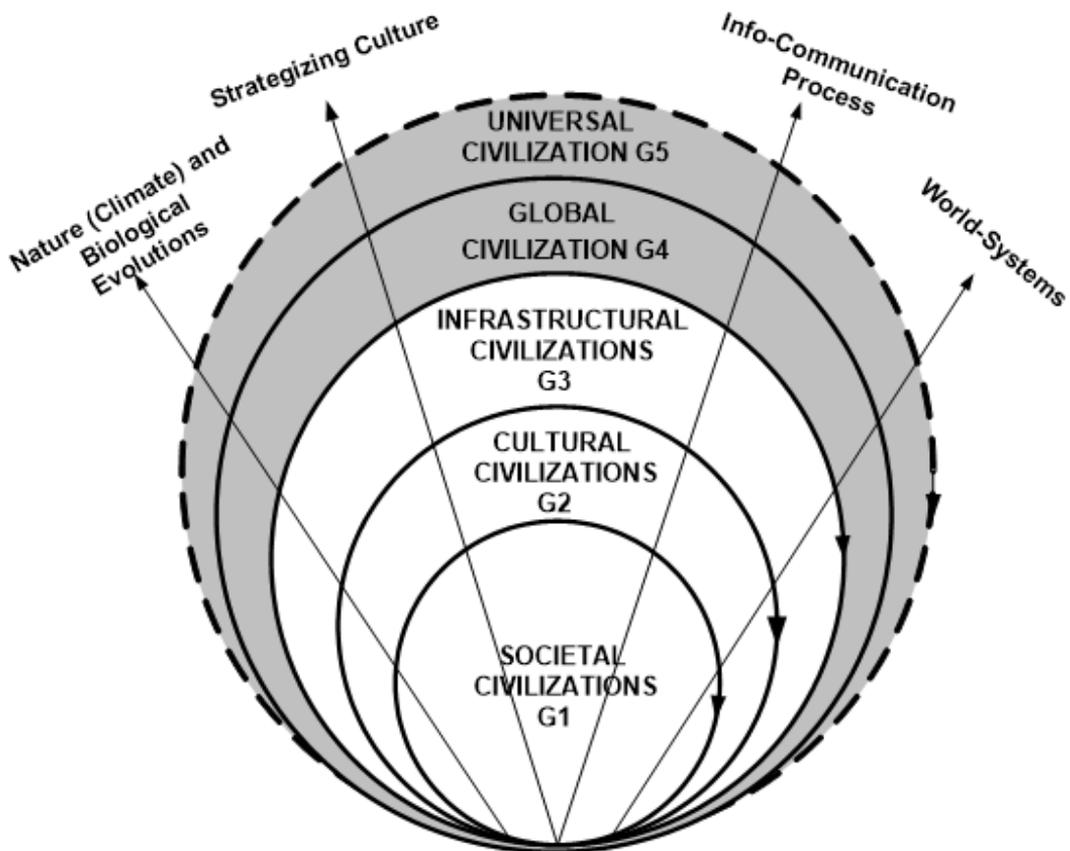
Figure 6. The generations of civilizations (G) and the main processes developing them.

- o The world-systems are critical for historical evolution of civilization, for example, such as "capitalism," "democratic revolutions," "undemocratic revolutions," "industrialization," "scientific knowledge," and "world wars." Those world-systems one can classify include large-scale world-systems (UN, EU, GATT, Internet); mid-scale world-systems (IMF, World Bank, NATO, Google, English, CNN); and small-scale world-systems (WHO, WTO, ISO, Amazon, the Wall Street Journal).

- o The biological and nature-driven evolutions impact each civilization stage and vice versa.

Observation 3: In the last 6000 thousand years the development of vertical civilizations, such as Mesopotamian, Egyptian, Sinic, Japanese, Islamic, Western, and others took place. About the year 2000, the first horizontal civilization begins its existence, under a form of the Global Civilization.

It is an infrastructural civilization, based on mediated-info-communication and an extended transportation network, guided by a policy of the free flow of ideas, goods, and services, and a still limited flow of people, through the global marketplace. The market forces mainly drive this civilization and do not satisfy many socially-minded people. Hence, there is a strong criticism of globalism.

Observation 4: The idealistic view of the future promotes the necessity to work on the development of a Universal Civilization (horizontal civilization, driven by cultural behavior), taking the best from all civilizations and providing goodness and wisdom for all humans. Vaclav Havel (1996) defined this quest in the following manner:

> "…Constantly talking about Europe, we have entirely ignored one of the pillars of the European spiritual tradition – universalism, the commandment to think of everyone, to act as everyone should act, and to look for a universally acceptable solution."

Jan Szczepański (1991), a former president of the International Sociological Association stated that:

> Today, universalism can be co-created as undoubtedly the most suitable answer to the challenges of the ideological vacuum. Already, universalism can be a barrier against individualism and egoism, the ideology of post-modernism, and all sorts of fundamentalisms and totalitarianism. Universalism will also be capable of examining and solving the problems of nationalism while retaining the most authentic values of national cultures.

Janusz Kuczyński (1986), founder and honorary president of International Society for Universalism, has stated that:

> "Universalism has to advocate the solidarity of all peoples and nations, which is rooted in our common human fates and our joint struggle against the ever more numerous and greater threats, including the nuclear suicide of Mankind."

Possible Further Research About Civilization

One can suggest the possible further research on civilization in selected areas, as follows:

- Research of relationships among society, culture, infrastructure (technology), globalization, and universality developments as the determining factor in civilization advancement or decline; such research can also explain current and future expected challenges.

- Research into human entities and their dynamics in transformations within a communities' ladder, due to civilizational challenges.
- Research of different world-systems and their impact on civilization development or regress, particularly in the 21st century.
- Research of the world civilization and its impact on international relations.
- Other topics

The excellent research opportunities now available are in innovative exploration deepened by:

- Interdisciplinary research into history, political science, technology, anthropology, medicine, and others.
- Big-picture-oriented research of civilizational responses to the globalization processes taking place in the society, culture, and infrastructure in the 21st century. Furthermore, what does lead to a new kind of civilization, which can be a global one or even human-machine one?

Conclusions

1. Based on the presented models one can define *civilization* as an interface between organized humans and the Creator and nature, which applies value and symbol-driven cultural behaviors, feelings, reactions and infrastructural tools to guide the purpose and quality of life and to control life-supporting resources and infrastructure. By *civilization* we mean organized people who purposely and skillfully improve the population, and its organizations' internal and external conditions; it concerns a population and its organizations' relation to nature, the Creator (Nature or God), and his/her fellow people. It is a state of affairs which can be of a physical, social, mental, and spiritual character which indeed requires our wise and large-scale-oriented intervention at the local, regional, spherical or/and worldwide levels.

2. After more than 150 years of developing the concept of civilization, it is perhaps time, as has been seen in other sciences, to recognize and agree upon the set of elements of civilization and research their individual and grouped relations, impacts and dynamics in different scopes and timelines. The purpose of the proposed undertaking is to regulate not only local communities, regions, and states but also to understand the nature of civilizations more clearly. This ruling should minimize conflicts, maximize the sustainability of Mankind and aim at a satisfactory quality of life, grounded in law and justice.

3. This investigation recognized 220 civilizational elements. However, the classification of the infrastructural elements has been just sketched. It will be easy to add another 80 to 200+ elements of this type.

One can possibly predict that civilization's cloud has at least about 500 essential elements. It is necessary to recognize these elements, characterize, and know their dynamics and impact upon us. Why? Because as we see today, we need to begin to rule our civilization if we want to survive on the planet Earth.

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