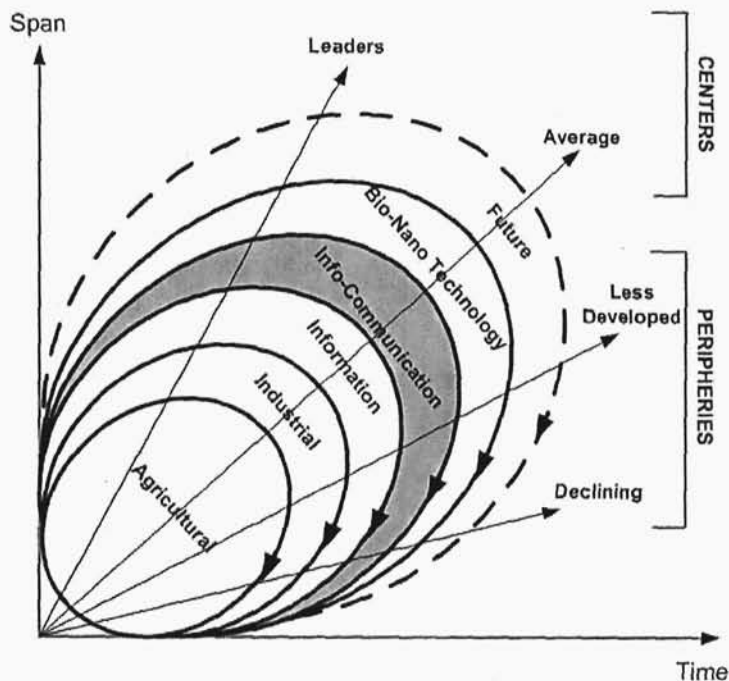


Figure 2-4. Countries in civilization transformations (The Targowski-Zacher Model)



waves create civilization centers that cooperate through fast diffusion of solutions. The remaining countries form the civilization's peripheries, which either adapt the centers' solutions slowly or even reject them on grounds of inadequate address of those countries' systems of values. The former is the case of the policy "to modernize but not Americanize" a country. Malaysia and Iran are good examples of this policy. A case of the rejection of the center was the policy of the Taliban government of Afghanistan.

Of course, the Wave Model is a rather limited paradigm which mostly emphasizes one civilization component—the infrastructure. On the other hand, this model provides a very good intuitive understanding of human development during the civilization centuries (Figure 2-4).

CONCLUSION

The modeling of civilization development and modeling of history in general are intrinsically based on "models," which must simplify the reality. This is their weakness. On the other hand, this approach is widely applied in many sciences, particularly in physics, chemistry, biology, medicine, and computing. These disciplines are invasive of individual humans, and errors in modeling their processes and systems may have strong repercussions in real life. But without "modeling," these disciplines could have only slow progress. For example, the Solar model of an atom developed by Niels Bohr in 1913 had a strong impact upon later discoveries in physics. Today, the Charge-cloud model of atoms is quite different from the original model, due to progress made in physics.

One may hope that *presented* models of civilization will trigger further research and will be improved by progress made in this discipline.

A. Further Research Directions

- Investigation of different civilizations' life cycles to provide lesson conclusions for the current well-being of the civilization
- Investigation of universal laws of civilizations in terms of civilizations' life cycles
- Prediction of further civilization life cycles based upon past cycles and new factors in order to prepare human entities for new challenges

B. Research Opportunities

- The research opportunities are in the interdisciplinary studies of history, economics, political science, technology and others

C. Additional Ideas

- How do different generations of humans impact the development or regression of civilization?

D. Rationale

- Interpretation of history as the repeating cycles of events was first put forward in the academic world in the 19th century in *historiosophy* (a branch of historiography) and was soon adopted by sociology. The *Saeculum* was first identified in Roman times. Unlike the theory of social evolutionism, which views the evolution of society and human history as progressing in some new, unique direction(s), cyclical social theories argue that events and stages of society and history are repeating themselves in cycles and thus there cannot be any social progress. Note that this is not valid for the modern

theories of long-term ("secular") political-demographic cycles, which can be applied for the study of civilization. Recently, the most important contributions to the development of the mathematical models of long-term ("secular") socio-demographic cycles have been undertaken by Russian scientists. The basic logic of these models is as follows: after the population reaches the ceiling of the carrying capacity of land, its growth rate declines toward near-zero values. The system experiences significant stress with decline in the living standards of the common population, increasing the severity of famines, growing rebellions, and so forth. As has been shown by Nefedov (2003; 2004), most complex agrarian systems had considerable reserves for stability, however, within 50-150 years, these reserves were usually exhausted and the system experienced a demographic collapse (a Malthusian catastrophe), when increasingly severe famines, epidemics, increasing internal warfare and other disasters led to a considerable decline of population. As a result of this collapse, free resources became available, per capita production and consumption considerably increased, the population growth resumed and a new socio-demographic (civilization?) cycle started. It has become possible to model these dynamics mathematically in a rather effective way. Note that the modern theories of political-demographic cycles do not deny the presence of trend dynamics and attempt at the study of the interaction between cyclical and trend components of historical dynamics.

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ENDNOTES

- ¹ $C = dS/dt$, and $F = mA$, where C = Change = the rate of change of the social level with time. S = Societal Level = the strength of a civilization in terms of political and social institutions, social cohesion, ability to innovate to solve social problems, capacity for technological innovation, flexibility in finding solutions, enterprise in meeting challenges. Mathematically, C is the time derivative of S .
- ² Grand models of the world civilization are defined in Chapter I.
- ³ By the word "empire," this author understands a political unit having an extensive territory or comprising a number of territories or nations and ruled by a single supreme authority.
- ⁴ M. Melko perceives the election of Boris Yeltsin as "476 A.D.," a decisive event in the termination of a civilization.
- ⁵ Many historians call the period 1,500-present "Modern History."
- ⁶ The models were developed by Andrew Targowski and Lech Zacher during a seminar at the Western Michigan University in March 2000.

