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Abstract: This paper addresses the disparate rate of development of different forms of culture in contemporary society. First, we outline the different forms of culture, based on the theory of Y. V. Rozhdestvensky; then we demonstrate that material culture in the form of technology is currently dominating cultural growth, spurred by the development of science; morality in the meantime develops, but also largely contains primitive tribal urges; we argue that the imbalance between different forms of culture is dangerous. Using the functional approach, we propose a few criteria of evaluating the dynamics of cultural development within and between societies.

On some issues in the study of technological progress in relation to all aspects of culture

Introduction

Humanity is at the beginning of the sixth stage of the technological revolution which will fundamentally change the priorities of the humankind's development. Some of the characteristic features of this stage are: fast development of nanotechnologies, broad automatization of all spheres of life based on robotechnics, new medicine based first and foremost on genetics, completely new use of natural resources, full scale virtual reality technology.

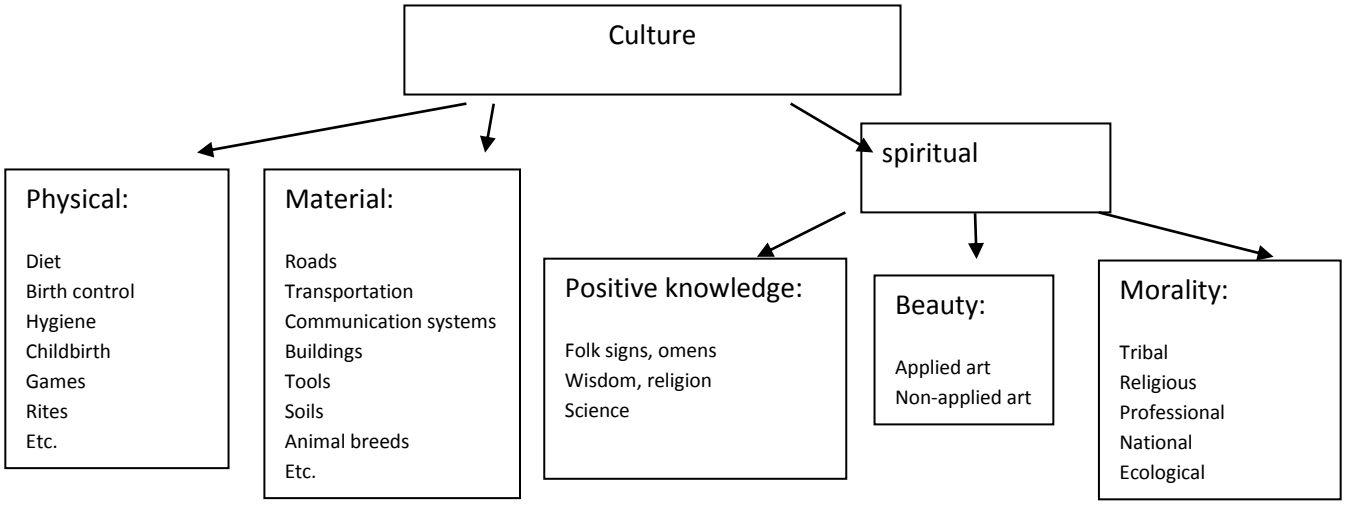
The speed of technological progress depends more and more on the adequate development of culture, which in turn depends on the technological progress, which stimulates the economic growth and thus creates the possibility of investing more resources in the functioning of all sub-systems of culture.

While during the past decades and even centuries the study of culture focused on its separate parts, in our time we are facing an insistent need to consider culture as a system of interconnected parts, to compare the levels of development of various sub-systems within this system, identifying disproportions in their development, overcoming the disadvantages created by such disproportions, and developing a common global strategy of the development of the entire culture.

Classification and interconnection of the components of culture

Culture can be studied from many different angles: its history, its nature and origins, its ability to include or disenfranchise members of society, or its applied value, i.e. its ability to influence the life of society. In any case a serious study must be based on a systematic approach, i.e. culture must be understood as a system of elements which influence each other.

Any systematic scientific study starts with a classification. Culturology is the discipline which creates and develops the systematic classifications of culture. In the West this discipline was proposed by Leslie White; in Russia the foundational work of Yuri Rozhdestvenky provided the detailed classification and description. Based on Rozhdestvensky's seminal monograph "Introduction to the Study of Culture" [1] we propose the following outline of the components of human culture:



Like parts of any system, parts of culture are interconnected. Throughout human history, spiritual culture in the form of folk wisdom, scientific discoveries or religion has had a leading role in the overall cultural growth of humankind. For example, religion as part of spiritual culture may influence physical culture in the form of the rules of birth control (or prohibition thereof). Religious rules may dictate which scientific discoveries are accepted or suppressed, for example the suppression of the solar-centric model by the church. Religious rules may prevent or slow down the development of some technologies, like barbed arrows or, more recently, cloning. They may also impose rules on the arts, for example in Europe until after the Renaissance artists were not allowed to study human anatomy, and in Muslim countries artists are not allowed to paint certain images.

Positive knowledge, which is a part of spiritual culture, influences material culture by determining its level of tools, buildings or infrastructure. Science may also influence physical culture; for example, the discovery of germs influenced the rules of hygiene by introducing the requirement to wash one's hands. New technologies also influence applied and non-applied art; for example, the discovery of electricity ultimately led to the creation of new musical instruments, e.g. the electric guitar, electric violin or computer-aided music. At the same time,

developments in technology, if not balanced by the information from other types of culture, may lead to losses and destruction, e.g. soil erosion from overharvesting.

Each new stage of human development poses new requirements to culture. The higher the level of civilization, the higher level of development is required from all its components. High levels of material culture require high levels of spiritual and physical culture; development of physical culture provides for healthy society members who participate in its scientific, moral and political growth, and high levels of spiritual culture can stimulate the development of physical and material components.

The leading role of science and technology and its connection to morality

In the 20th and 21st centuries scientific developments have taken a leading role in the overall growth of culture. Just a few examples will illustrate this point:

- The discovery of electricity in the 19th century has translated into the availability of electric tools for industrial and for household use.
- In art, scientific advances have lead to the creation of entire industries: cinema, television, animation, computer animation, etc.
- In medicine, scientific progress is allowing to shift treatment to the genetic level, where fixing a gene is more efficient than treating the symptoms caused by the deficient gene.
- In education, scientific progress requires the society to produce a larger proportion of educated workers; conversely, large numbers of educated people spur the scientific developments.

The most complex relationship is the relationship between scientific progress and morality. Historically, morality (linked to wisdom and religion) has provided an important system of checks and balances for other forms of culture. In the modern world, when science has provided humankind with the tools of mass destruction, the role of morality becomes especially important, since in the hands of unscrupulous politicians, fanatics or simply incompetent and uneducated users the products of civilization have the power to destroy the civilization, be it through climate change, biological warfare or nuclear explosions.

The higher the level of scientific and technological progress, the more danger humankind presents to itself. This requires that humankind sustain and develop instruments to curb the danger of destruction created by its scientific progress. The only component of culture capable of controlling the dangers of progress is **morality**, which is developed in families, schools and religious institutions.

Levels of morality

Morality levels accumulate within societies [1]. These levels are:

- tribal (justifying murder for the sake of protection of kin or tribal territory),

- religious (where the murder of a non-relative is as condemned as the murder of a relative),
- professional (often involving exceptions to religious morality, e.g. artists who are required to prefer beauty over truth),
- national (often putting people of the same tribe or religious affiliation on different sides of a national allegiance, and requiring people to die for the flag, i.e. for their country),
- ecological (the level that presumes to overcome tribal, religious or professional allegiances for the sake of global well-being).

Humans have always used brutal force to punish or scare representative of other tribes, other religions or other nations. Those levels of morality support the wars, murder and theft, if they are perpetrated against the members of a different tribe, a different religion or a different nation.

The problem of the modern world is linked to the fact that individuals on the tribal, religious or national level of morality, who feel justified in using brutal force, are now in possession of technologies which, when used against their perceived enemies, put in danger the entire planet.

Only when the ecological level of morality becomes dominant, may the humankind be protected from its own scientific and technological progress.

The task of harmonization of the levels of different components of culture

Thus, in the modern world it has become especially vital to study the misbalances and to harmonize the levels of development of different components of culture. The need now is greater than ever to close the gaps between moral and technological levels of society's development. A specific example of problems caused by such gaps can be found in the war in Chechnya: the rich material resources of this region have not been matched by equally developed educational resources which lead to its unsatisfied spiritual needs in education. After the first Chechen war in a devastated city on poor paper the Chechens published a brochure on rhetoric, a group of scholars in cooperation with the Linguistics Department of the Moscow Lomonosov University began to develop a thesaurus for education in Chechen schools, and the university in Grozny was translating that thesaurus into the Chechen language, creating necessary vocabulary in the process of that work. After the war resumed, the dean of the Chechen University fled to Russia; the thesaurus project, unfortunately, was a casualty of that war. A better balance between educational resources, moral dev elopement and technological abilities of the societies involved c ould have helped avoid the problem.

Based on the functional approach proposed in [2], we outline below some components of a systematic program of evaluating and harmonizing various sub-systems of culture. This program needs to be further discussed, developed and implemented on a world-wide basis.

1. For a more detailed study of this problem, humanity must develop unified approaches to the evaluation of the levels and development speeds of each sub-system of culture. For example, methodologies need to be created to evaluate the level of morality and to compare it with the level of technological development. Such methodologies may

include observing and recording the actions of governments and the reactions of individuals. If, for example, a government possesses the most advanced weapons, like nuclear, and at the same time exhibits xenophobia or aggression towards other countries, a misbalance would be recorded between the level of morality and the level of technology.

2. International and regional comparisons must be made, making sure that the comparisons are corrected for the distortion factors. A thorough methodology needs to be developed for these comparisons. Regional comparisons will allow to prioritize the investment decisions based on which regions need the most investment in which areas.
3. Criteria must be developed to evaluate and compare the effectiveness of cultural sub-systems. Knowing which sub-system of culture produces what effect will contribute to the investment decisions, e.g. comparing the effectiveness of investment in medicine vs. education, in transportation vs. land cultivation, in hygiene vs. diet, in societal rituals vs. applied art.
4. Unified statistical basis needs to be created for conducting the research. The present system of gathering statistical information should be evaluated to determine if it is sufficient for this task.
5. An organization should be appointed to coordinate this project.

Such a systematic approach to the study of different components of culture will allow the international community to understand and explain the phenomena of misbalance, and to approach rationally the distribution of effort in harmonizing the situation.

References:

[1] Rozhdestvensky, Y. Introduction to the study of culture. Moscow: Dobrosvet, 1996
[2] Karpunin, M. and Maydanchik, B. A guide on cost analysis. Moscow: Financy I Statistica, 1988

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