No. 1(26)

ISSN 1730-802X
eISSN 2300-8121

Different approaches to the future in the work of the Forecasting Committee

ed. by Konrad Prandecki

PAPERS ON GLOBAL CHANGE

PAN
POLISH ACADEMY OF SCIENCES

Different approaches to the future in the works of the Forecasting Committee

Ed. Konrad Prandecki

Warsaw 2020

The "Poland 2000 Plus" Foresight Committee
of the Polish Academy of Sciences, Warsaw, Poland

EDITORIAL OFFICE
Polish Academy of Sciences
00-901 Warsaw, Defilad Sq. 1, PKiN, room 2503, Poland
e-mail: elzbieta.swoboda@pan.pl

Editor: Konrad Prandecki

Translation: Daniel Sax

ISBN 978-83-66847-29-3

Series: Papers on Global Change, ISSN 1730-802X, eISSN 2300-8121

CONTENTS

FOREWORD

Papers on Global Change was a journal published annually by the International Geosphere-Biosphere Programme (IGBP). Since 2017 (since issue 24/2017), our journal itself has been experiencing a process of significant change, in connection with the fact that the IGBP drew to a close, marking an end to the related activity conducted by the Polish Academy of Sciences. It was initially uncertain whether journal would continue. In the end, we decided that the title and the issues raised in it should survive, but in a slightly different form. Instead of a journal, we decided to maintain a series of monographs devoted to global problems. The initial result you are now holding in your hands.

The process of change is not yet complete, however, we believe that this new form will suit your expectations. Nevertheless, a new direction for the Papers on Global Change future has been set by linking it to the work of the "Poland 2000 Plus" Foresight Committee of the Polish Academy of Sciences (PAS). The first and most visible change is in the form of publishing. The journal became a book. The subject matter of the journal will also be altered slightly, as is demonstrated by the contents of this issue. This certainly does not mean that the topics discussed in the 25 issues of the journal will be abandoned – publishing articles on global change will indeed remain the guiding principle of the book. We will in addition be focusing on issues of the future, so that our articles point out the opportunities and threats related to the future of the world.

At the same time, we wish to expand the thematic scope of our publication. In addition to the environmental issues that the notion of sustainable development has mainly been used to address in recent years, we also want to publish articles about other facets of this important concept, i.e. social and economic problems. Often, these topics will be interconnected. The articles will not have to refer directly to sustainable development, and they may indeed even point out the consequences of unsustainability, i.e. to what may happen if the current paths of economic and social development are continued. The goal is to reflect on the direction in which the modern world is heading.

We also wish to adopt a longer-term view of the future (i.e. adopting a perspective of at least a decade or two), and so such articles will be given priority for publication in our pages. At the same time, the future will not necessarily have to be addressed overtly or directly; sometimes articles dealing primarily with the past, yet relevant in the context of research on the future, will also be published.

This issue is meant to serve informative purposes, illustrating the change in the subject-matter that will be dealt with in the series. For this reason, we decided to shift the emphasis away from environmental issues in a particularly prominent way, and instead focus very much on the socio-economic and humanistic issues that are predominantly addressed by the PAS Foresight Committee. By so doing we wish this issue to demonstrate the extended possibilities of publishing on global change and also to help showcase the achievements of the PAS Foresight Committee, boosting its visibility in the international arena. For this reason, in addition to new texts, in this issue we have decided to include articles that have already appeared in similar form in the publications of the Committee. In subsequent issues, we will only publish new articles and we also intend to highlight the problems of the natural environment to a greater extent.

This issue presents six articles, which are quite diverse in terms of the topics addressed, length, and form. We would like this heterogeny to demonstrate that we are open to a variety of proposals for articles to be published in the journal.

This issue is opens with a lengthy article by Jerzy Kleer and Konrad Prandecki entitled "*A world defined by change: a historical and methodological approach*". The authors seek to show that in the history of mankind, change has been a constant phenomenon, accompanying us since the dawn of time; as such it should not be equated solely with the processes taking place today, e.g. with globalization. Although the issues discussed in this text mainly refer to the past (contrary to the editorial declarations above), the article is suited for the journal – as we noted – because the issues are of considerable relevance in the context of the future.

The second article is "*The reverberations of globalization*" by Paweł Kozłowski. It presents various kinds of reactions to globalization, which now seem to have a greater impact on global processes than globalization itself.

The third text, "*Waves of Information Revolution*" by Jan Grzegorek and Andrzej Wierzbicki, describes the wave-like nature of the information revolution, both in the context of the past, e.g. the development of television or computers, and the future, i.e. the development of robots, knowledge engineering and biomedical engineering.

The fourth, quite short article, "*Determinants of human development*", was written by Leszek Kuźnicki. The author briefly, albeit comprehensively, presents the most important determinants that have underpinned the worldwide domination of *Homo sapiens sapiens* as a species. In particular, these involve group cooperation and aggression towards strangers. These considerations may serve as the basis for further work on the human ability to solve global problems.

The fifth article, "*Where are we headed? Reflections on civilization, culture, and education*" by Irena Głuchowska, offers reflections on human responsibility for the future that we will bequeath to future generations. The author postulates that we should not judge the future in the context of the conditions that surround us, i.e. looking for an answer to the question "Where are we headed?", but rather focus on the context of "What can I do?"

This issue closes with Konrad Prandecki's article "*Factors affecting the availability of food in 2050*". The author presents numerous factors influencing food availability and tries to shed light the interrelationships between them.

All in all, with this collection of articles we aim to highlight the new opportunities for publishing in *Papers on Global Change*. We hope that the new form and profile of our publication will facilitate more comprehensive discussion of global issues and also bolster the status of the monograph itself.

Konrad Prandecki

Jerzy Kleer[1], *Konrad Prandecki*[2]

A WORLD DEFINED BY CHANGE: A HISTORICAL AND METHODOLOGICAL APPROACH

Abstract

This chapter attempts to characterize the fundamental factors that underly the continual emergence of change in the world. Adopting a historical and methodological approach, taking a very broad scope of the various stages in the advancement of human civilization, we explore the pace and nature of this perpetual change, seeking to show that it is in fact independent of globalization processes. Instead, we see continual change as stemming primarily from people's both individual and mass needs (for consumption, security, development). As such, we propose a seven-way configuration of interrelated factors driving change in the world, and briefly examine each of these in turn: broadening knowledge about the world, elites, education, technology, territorial expansion, warfare, and the impact of earlier stages of civilization on the newly emerging stage. The modern-day world is, in fact, an amalgam of three interlocked stages of civilization, and is drawing ever closer to a new inflection point, a new civilizational transition – with the attendant chaos, degradation of the traditional model of the state, and risk of conflicts of a new sort. We conclude that these factors do not, in large part, follow directly from globalization – rather, the latter merely speeds up their pace or facilitates the flow of information, thus making it easier for us to recognize them.

Keywords: change, global change, globalization, factors affecting change

1. Introduction

Today's world is defined and driven by change. Scholars studying the subject often draw attention to the great magnitude of changes observed in the world and their rapid pace, arguing that they have been caused chiefly by globalization, which has necessitated an ever-faster pace of technological progress. It is often stressed that the changes are indeed so abrupt that individual humans, and indeed even entire societies, have trouble keeping pace with absorbing the effects of the broadly-understood progress brought by the advancement of civilization, which often leads to social exclusion.

However, even a brief look at the history of mankind reveals that it has, in reality, always been characterized by change, and this fact is independent of

[1] Institute of Economics Polish Academy of Sciences
[2] Institute of Agricultural and Food Economics National Research Institute

globalization processes. Irrespective of how we define globalization, we can point out that even closed communities undergo evident changes – their pace may be a lot slower, but the process as such is indisputable.

Consequently, it must be said that **this search for new solutions has been a characteristic feature of mankind since the dawn of its history**. Changes are visible at every stage of the advancement of civilization, irrespective of whether we mean hunter-gatherer, agricultural or industrial societies or the newly-emerging post-industrial stage.[3]

At the same time, irrespective of the constant nature of change, we can observe that these processes are not identical across the world. **Rather, they are diversified, both in terms of intercontinental interdependencies and within specific continents. What is more, such differences are evident also within societies.** These observations provide food for thought on the factors that affect the pace, nature, and impact of the changes taking place in individual societies.

The purpose of this study is to identify and characterize the fundamental factors behind the emergence of change in the word, as well as the pace and nature of those changes.

2. Changes taking place in the world

Considerations, such as these, about understanding the world as being defined by change should of course be supported with examples of the processes that have been influential for the present characteristics of humanity. For reasons related to the nature of this study, we have decided to select what we see as the most important changes in order to illustrate the ongoing processes. The limited space here also prevents us from sketching out even the general characteristics of such processes, but this does not appear necessary in light of the goals of this chapter.

For the sake of simplicity, **we divide the processes of change into three key periods**: **the historical period**, or the times from the beginning of human

[3] We, the authors of this study, are of the opinion that the world is facing another major inflection point that will result in the arrival of a new stage of civilization. This process has already begun, but it is long-term in its nature and will most likely last decades. At our current moment – namely a transition from one stage of civilization to another or, as we shall call it, a civilizational turning point – it is difficult to pin down the characteristics of the newly-emerging next stage of civilization, because the direction of changes has yet to be determined to a sufficient extent, and the external factors are not powerful enough to define it.

For these reasons, the exact shape of this newly-emerging stage remains unknown. In the scientific literature, one can find various terms pointing out something qualitatively new in terms of socioeconomic links, these include the “third wave”, “network society”, “wisdom society”, “knowledge society”, “post-industrial society”, and so on. Simultaneously, it is stressed in the literature that changes in conditions may take a turn for the worse, with threats necessitating a greater focus on survival as opposed to flourishment, as is demonstrated by such proposed concepts as “survival society” and “zero growth”.

history to the mid-1970s; the period of **globalization** (1975–2000); and **the transition to a new stage of civilization** (from 2001 onwards). This division is arbitrary, and the dates presented above are intended not to reflect specific events so much as to convey our general way of thinking to readers. As such, we link the beginning of the current stage of globalization with the changes in China's policy following Mao Zedong's death, the rise to power of Margaret Thatcher and Ronald Reagan, and the spread of neoliberal policy.

Distinguishing between these periods is especially important for globalization and the transition to a new stage of civilization, because in practice these two processes overlap in time. The globalization wave that started in the 1970s continues until the present day. In recent years, however, we have observed the presence of additional factors that affect changes and make it possible to describe this period as a civilizational turning point, or a transition to a new stage of civilization. It is impossible to pinpoint precisely the moment of such transition, but still we must somehow recognize that recent years differ from previous periods, so we have decided subjectively to define this transition as having started with the arrival of the new millennium. That said, we must stress that this is a great simplification.

The historical period was the longest, so we can expect that it was characterized by the most profound change. If we take into account its scale, this approach is indeed legitimate. But if we compare these transformations with the ones that took place in the era of globalization and during the subsequent transition to a new stage of civilization, we will see that the pace of change in the following periods was much more rapid, and some processes were equally significant.

One purpose of our examination and juxtaposition of these periods is to show that the history of mankind has always been characterized by the presence of change. Another is to list the important transformations that occurred in the different periods we have identified.

In the historical period, we can identify the following areas in which changes took place:

- the style of life (from nomadic communities through agricultural rural communities to urban cultures);
- the socio-institutional system (from tribes to nation states);
- production (from handcrafting through primitive machines to assembly-line based manufacturing);
- the organization of economic activity (from self-reliance through quasi-open economies all the way to national economies and international trade);
- governance (from leadership based on force through monarchy and aristocracy to democracy);
- communication (from oral communication through writing to the use of radio waves);
- the organization of the basic social unit (from tribes through clan or guild membership to family).

In the era of globalization, changes went even further and encompassed the following fields:

- the organization of international trade (from economies with customs barriers to ones close to allowing the free movement of goods and capital);
- the ways in which the world is presented (from newspapers and reporting to the Internet and live video transmissions);
- the organization of governance (from sovereign nation states, through a system based on multilateral interdependencies, to economic integration and the growing role of multinational corporations, which contribute to degrading the existing model of the state);
- the system of government (the evolution of democracy to a quasi-democracy based on populist technocracy, and simultaneously the transition from authoritarianism to authoritarian developmentalism);
- the organization of production (from national production to outsourcing and just-in-time delivery to the relocation of production to target markets or to countries with lower costs).

The period of the transition to a new stage of civilization, in turn, has been characterized by changes in such areas as:

- the organization of the basic social unit (from the more traditional family to partnership-based relationships, one-person households, and single parents);
- means of communication (from direct interpersonal communication to a network society whose members rely on online means of communication);
- the conduct of warfare (a slow shift away from the direct engagement of military personnel towards unmanned technologies and cyberattacks, and away from direct combat towards indirectly undermining the adversary state, including launching cyberattacks against the key components of the economic infrastructure and swaying public opinion, for example through "troll factories");[4]
- governance (the transition from quasi-democracy to "mediocracy" – i.e. the use of the media to communicate and hold consultations on political decisions and influence public moods – as well as the emergence of plutocracy).

The above list is by no means exhaustive, but we do feel that it names the most important changes in the sphere of development. However, even this short

[4] A new form of conflict and fearmongering came to be observed in July 2020, when residents of the United States, as well as the United Kingdom and also Poland, received packages from China that contained unidentified seeds. Most likely, the unsolicited packages were intended to be promotional, i.e. aimed at getting likes on social media, but the US authorities regarded them as a new type of threat. People were warned not to open unwanted parcels and to send any opened packets of seeds to the federal authorities. Since the packets were sent without any explanation, the authorities assumed that the seeds may have been distributed to cause the spread of a new invasive species in the United States that might harm the local ecosystems. This led to the emergence of a new type of conflict and a new tool used for the purpose of fearmongering.

catalogue shows that all these periods were (and are) characterized by major changes that have redefined the socioeconomic relations both between and within specific societies to a significant extent.

3. Perpetual elements of change

Once we conclude that change is indeed a perpetual element of human civilization, we should try to answer certain important questions: What components have a strong impact on change? What is the nature of these components? What processes or conditions do they apply to? Formulating even general answers to such questions will make it possible to arrive at an answer to the question of why the world is constantly undergoing change.

Our general answer is this: **This situation is related primarily to the both individual and mass needs that people have.** But if so, then the corollary question arises: **What is the nature of these needs?** We may be helped in answering this question by Maslow's hierarchy of needs. Without going into detail, we can distinguish between three major groups of universal needs which, taken together, have not only determined the survival of humans as a species but also impacted on our development in both qualitative and quantitative terms:

- **needs related to broadly-understood consumption, both individual and collective;**
- **the need for security;**
- **needs related to continuous changes that result in development.**

Development was presented in a similar way by the 19th-century theorists of economic integration, for example those who advocated the concept of *Grossraumwirtschaft*, justifying the need for integration and development with external threats, which they saw as the most powerful stimulus for action.

3.1 Consumption

Broadly-understood **consumption** has always been a prerequisite for the life and functioning of humans as a species. Historically speaking, the possibility of obtaining food served as a starting point for the development of mankind, so it is no coincidence that the basic form of civilization was agrarian society, whose main goal was to ensure an adequate supply of food. Different analyses say that this stage was preceded by hunter-gatherer society, but we do not have enough information about this stage of civilization to describe it in a reliable way. Moreover, the population clusters within this group were too dispersed to allow us to talk about a single, uniform stage of civilization.

That said, this stage of civilization was also characterized by changes. Their pace was rather slow, but hunter-gatherer societies were the ones that harnessed fire and made the first tools, in addition to satisfying their spiritual needs

(for development) through what was the first evidence of religious worship. The changes described above were fundamentally important for mankind. Hunter-gatherers also started farming land, which changed their lifestyle and methods of foraging for food, thus satisfying one of the most important needs that humans have.

Today, we are unable to say with all certainty what factors led to the expansion of agrarian society. The difference between hunter-gatherer society and agrarian society lay chiefly in their foraging methods. It is usually believed that hunting and gathering were less effective than farming, but many studies have shown that at the initial stages of the development of agriculture, harvest failure and the risk related to ill-managed farming translated into a much greater risk of famine than migrations of animals hunted for food. For this reason, it appears that other conditions such as the possibility of obtaining food as part of a more permanent, sedentary lifestyle were equally important as predictable access to food. Such advantages may have included the possibility of forming permanent settlements near flint mines. This, in turn, facilitated greater access to goods and the satisfaction of non-food consumption needs.

Development was coupled with the gradual emergence of ever-wider consumption needs that went far beyond the normal subsistence needs, i.e. having adequate amounts of food, clothes, and living conditions. Such needs include the development of religion, law, the manufacturing of goods taking into account esthetic needs, and later also the development of art. Irrespective of this, agrarian societies are still dominated by needs related to survival.

A more permanent and settled lifestyle led to more changes, three of which deserve special attention. First of all, the development of agriculture, which facilitated not only the formation of permanent settlements but also the satisfaction of the needs of larger groups. This led to the emergence of cities as centers of development. Secondly, permanent settlements facilitated exchange between different societies, because those who were on the move knew where they could find a specific group. This translated into easier trade. Thirdly and perhaps most importantly, the formation of permanent settlements led to the specialization of labor, chiefly as a result of the development of cities, and lay the groundwork for the emergence of education systems.

In addition to farmers, whose task was to obtain food, other roles emerged that included warriors, administrators, priests, thinkers and inventors, artists, and many other professions. Such a division of labor varied depending on the period in history and territory, but we may omit such considerations here. We should stress, though, that social differences have existed since the beginning of humanity, and only small groups in society, in all periods in history at that, had factors of production or other forms of pressure on those deprived of such leverage in order to obtain resources needed for survival either through hard work or through engagement in armed expeditions.

3.2 Security

If compared to the consumption of food (and not only food), **security is equally important for survival and in some situations even more important.** Security applies to both individuals and larger groups, or indeed entire societies. Problems related to security have a long history and have undergone quite important changes. **Roughly speaking, such problems may be analyzed at four levels.**

The first, lowest of these levels, which is nonetheless the most important one from a certain perspective, pertains to individuals, or more broadly to the family. In this configuration, individuals must look after their own security as well as the security of their family and those close to them. Security threats at this lowest level may result from financial motives (the need to have resources necessary for survival as well as the risk of being robbed and deprived of property), social stature, and political or religious differences. Conflicts rooted in such motives may be isolated, prolonged, or even persistent (i.e. passed down from one generation to another). Regardless of their duration, these conflicts and related threats, perhaps with the exception of certain political conflicts, have existed since the beginnings of humanity. But even if an individual threat is eliminated, it may be followed by the emergence of another threat of the very same nature, albeit on the part of a different person. For example, the imprisonment of one thief does not protect us from being robbed by another. In certain situations, however, specific threats may be mitigated or may even disappear. In theory, such conflicts and threats even gave rise to strong bonds, for instance through marriage, the emergence of a more powerful mutual enemy, or other reasons – there are plenty examples of such situations, in different societies at that.

The second level is related to tribes and groups, and in later periods to class, social, religious, political, or partisan affiliations. It differs from the first level mainly in that it pertains to security understood much more broadly and requires the involvement of different social groups. Secondly, it applies to the security of not so much an individual or family as a group or groups that pursue rather clearly stated goals, related to the applicable political or religious principles or social liberties and rights. Since such differences also occurred in the past, occur in the present, and will most probably arise also in the future, they prompt or even force all those who profess the same views or have common interests to unite. What is important from this perspective is the dominant cultural system.

The existence of such diversified groups invariably leads to various conflicts, which often create long-term divisions in society. Such conflicts never die down completely, but they are sometimes alleviated to a certain extent or even lead to the establishment of collaboration. This has been particularly visible since the emergence of sovereign nation states, but the aforementioned conflicts and their positive resolutions also occurred earlier.

The third level of security is related to the state. Unlike the measures available at the previous two levels, the state has other resources at its disposal to

minimize threats and conflicts. These include coercive measures and institutions in the form of different military formations aimed at ensuring not only public but also individual security.

Such coercive measures and institutions have two sources. On the one hand, they result from the long evolution of mutual relations between different social groups and ultimately become applicable norms. Their violation does not always result in sanctions being imposed, but the odium they attract from groups or societies means that they can be regarded as binding norms. Coercive state institutions, in turn, have a different nature. They create an entire system of dos and don'ts, laying down different regulations that on the one hand aim to ensure national security and the transparency of the applicable norms of behavior and on the other one determine the relations (or the rules of dealing) with other countries or external societies.

Institutional rules and norms, despite their long-term nature, evolve as a result of development and economic, political, and social changes on the scale of not only specific states, but also continents or even the world. The characteristics of institutions or their nature may be, and often is, imitational, or taken over from more developed countries.

The problem of security has always been and will always be strongly linked to the conditions of consumption in a specific society. Security is not only an important element of the survival of humans but also a major driving force behind development. Without the continued improvement of the standards of living and security conditions, development may be combined with regression. This has happened in the past on many occasions, is often the case in the present, and will most probably occur also in the future.

The fourth level involves global security. This type of security is still at the initial stage of development, and it is indeed not fully clear if it will ever turn into a full-fledged system. This stems from differences in the particularistic interests pursued by people who live on different continents and in different countries. However, we can observe more and more frequently the need for joint action on the part of humanity to ensure conditions that facilitate the survival of humans on Earth. This applies chiefly to cooperation in countering the excessive stress that humans exert on the environment, but such efforts also include the prevention of a nuclear war, terrorism (in the latter case, this is not as obvious as in other ones), etc.

In the context of worldwide action, the best example of global thinking about security can be found in the attempts to counter climate change. In addition, we can observe a growing risk of the emergence of a range of other, equally dangerous threats, for example those referred to as planetary thresholds. Such threats affect all people, regardless of their ethnicity and views. What poses a problem, however, is their hard-to-capture nature and the absence of a clear method of resolving them.

The complicated nature of global security solutions may be demonstrated by the example of actions related to the COVID-19 epidemic. The problem affects all

of humanity, but instead of collaboration aimed at getting to know the enemy (the virus) better, we have witnessed a cacophony of mutual recriminations and attempts to advance particularistic interests, not necessarily related to the epidemic. In this context, the United States' moves to withdraw from the World Health Organization (WHO) may be seen as the culmination of such trends, limiting the possibility of international cooperation and the resolution of problems at the global level.

It must be stressed that the fourth level of security as such is still not yet a sufficiently significant stimulus inducing change, but this situation may prove substantially different if its importance rises. Depending on the magnitude and rapidity of threats, adjustment measures taken on the scale of the globe may even assume very radical forms, for example a change in the paradigm of economic governance.

3.3 Needs related to development

The third component comprises the needs that are related to development, both personal and social. Development pertains to spiritual and material needs. It may manifest itself in efforts to boost one's social position through the increased possession of more goods or in the form of the development of human civilization, for example through new inventions or innovative solutions. **Stimuli for development (change) may differ in their nature. Here, we should place the emphasis on two: education and people's need to compare themselves with others.**

Education is crucial for generating knowledge and creating tools for creative thinking. **Also, it is a component that in its formalized form was the last to be included in the list of social needs, but the closer the world approached the modern era, the more important this component became**.

For many centuries, or strictly speaking millennia, education was practically inaccessible to an overwhelming majority of societies – a situation that did not change until the Late Middle Ages. With the arrival of the Industrial Revolution and the industrial stage of civilization, the development of education started to gather momentum, but it accelerated in a significant way only in those societies and countries that were characterized by the emergence of a new model of functioning and demand for people who were educated, be it at lower or higher levels.

Such development was initially observed mainly in the countries of Western Europe, but it gradually spread across other European countries, including those that had emerged under the influence of the European cultural circle. From this perspective, a breakthrough came in the aftermath of the two world wars, especially World War II.

On the one hand, this situation was affected by the rise in the number of countries. When the world was on the brink of World War I, there were 15 sovereign states in Europe. Today, there are 44. This translates into growing demand for people who are educated and capable of governing sovereign states.

On the other hand, similar phenomena can be observed in the economy, where a higher level of development translates into growing demand for well-educated workers, whereas unqualified workers have greater difficulty finding jobs. Increasingly, labor involves the operation of specialist devices, as opposed to the simple application of human muscle-power.

This phenomenon has become particularly visible in recent decades. Hence, education is becoming an essential commodity, such as consumption and security. In this context, we could say that the arrival of information society has necessitated relatively universal education, which is a prerequisite for changes and for understanding their nature.

Basic conditions for modern-day development include changes not only in technology but also mental changes, and the latter are practically impossible without education. Hence, we can view education as one of the most important sectors that have influence over development and, more important, the changes taking place in the world.

For this reason, education has become one of the most important public goods in which the state is engaged. This holds true for both public and private education. Better educated individuals have greater possibilities of securing their own wellbeing.

In turn, **people's need to compare themselves to others** has practically always been part of human nature. Humans need to stand out among others, for example by looking "better". This need may take on many forms, pertaining to both wealth (the goods in someone's possession as well as their value, the accumulation of goods deprived of utility functions, such as works of art, historic monuments, and so on) as well as the spiritual aspects (the possibility of participating in exceptional cultural or religious events, experiencing unique aspects of nature, having access to works of culture, gaining recognition in the eyes of others, and influencing the course of events, for example as a result of one's political position, professional titles, scientific degrees, and so on). Changes that result from such comparison with others may be effected through both positive and negative actions. The former include all action aimed at creating something or achieving added value, for example formulating a new scientific theory, creating an invention, setting up an enterprise, and so on. The latter comprise the steps taken to worsen the situation of others while maintaining or improving one's own situation. In this case, there is also a wide range of tools that can be used, starting from simple theft or robbery, through the creation of fake news and negative opinions, all the way to much more complicated actions that involve using one's own position and authority to discredit individuals or social groups that might serve as a point of reference. We can find plenty of examples of such actions in the world around us, so we see no need to list them extensively. It is important that we stress people's need to stand out from the rest as a strong incentive leading to change. Its impact is significant at the level of both specific individuals and groups (local communities, nations, religious groups, and so on).

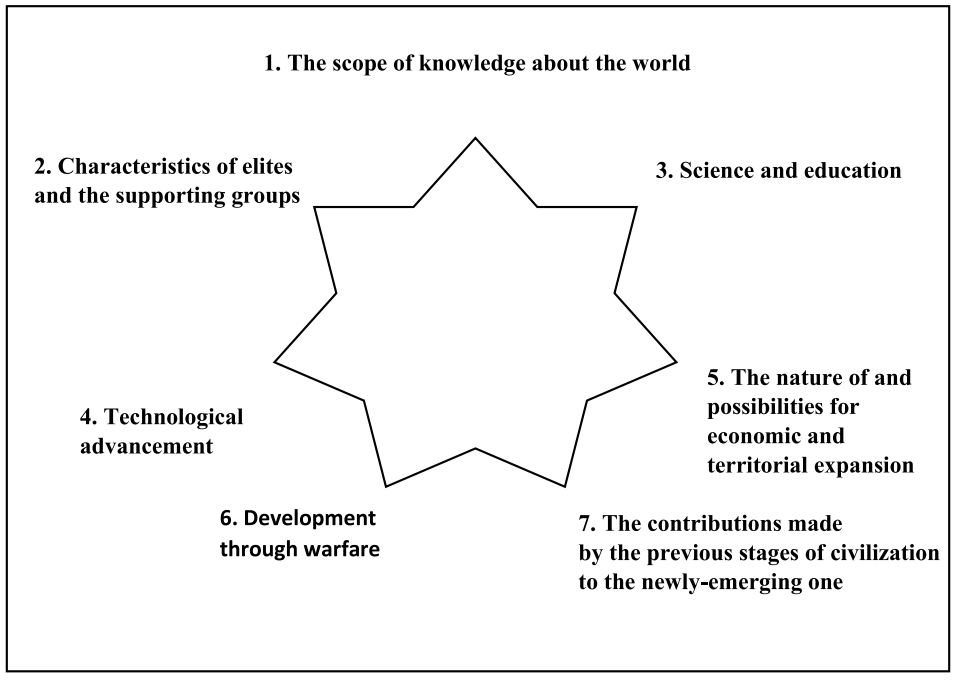
4. Historical factors behind development

Securing the continued improvement of the conditions needed for survival has always been the starting point for development processes. However, analyzing them, especially in the long-term (including the past, the present, and the future), requires us to take into account more components and, more importantly, their differing nature. That said, it seems that the human individual will remain the most fundamental driver of all change, setting the direction or directions of development for larger groups and communities of people.

We will not attempt to go into detail on the different characteristics of development, which has always been globally diversified, but instead now wish to take a closer look at the factors that have influenced this process in the past stages of civilization, the present stage, and the new stage to which we are currently transitioning.

Development (change) may be caused by different factors whose exact number may vary depending on how detailed the topics we analyze are. Taking into account the key components that affect development, we may present them as falling into a certain **distinctive, seven-way configuration of interrelated factors**. Before we present this analysis, we must stress that the role of these

Fig. 1. Seven-way configuration of interrelated factors driving change



Source: authors' original proposal

components has changed in different periods of history and in different regions. In addition, they often fulfilled different functions in different countries. The order in which they are presented is not intended to reflect their importance, but it does signify the sequence in which they appeared in history, not so much individually as to a certain extent collectively. The collective nature of these factors becomes more significant as we transition from one stage of civilization to another or from one epoch to another. This means that the number of those actively participating in such changes grows.

4.1. Ever-growing knowledge of the world

If we look at the history of the world, the gradual development of the human species, we will see that one of the most important characteristics of emerging societies was their ever-increasing knowledge about the world. Getting to know the world was a gradual and evolutionary process that was related to the capacity of individuals or social groups to move around and transfer the acquired knowledge. Roughly speaking, we can distinguish between four major phases of world exploration, each broadening human knowledge about the world, chiefly from the perspective of the part of the European community that was the most active in this respect.[5]

Phase one:

This phrase is essentially linked to the emergence of the Roman Empire, or the period from the reign of Octavian (the 1st century BCE) until the division of the Empire in 395 into the Western Roman Empire (which lasted until 476) and the Eastern Roman Empire, later called the Byzantine Empire, conquered by the Ottoman Turks in 1453. Geographical knowledge encompassed the Mediterranean Basin, the Middle East, and partially some regions in Asia.

Phase two:

Although geographical discoveries have a long history that dates back to 600 BCE, it is assumed that the beginning of perpetual and continua change in the world was ushered in by Columbus' discovery of America (1492). Although major regions in Asia had been discovered before, certain aspects of the great transition from agrarian society to industrial society are usually linked to the discovery of America.

[5] In the historical context, we should note a certain paradox that becomes evident when comparing the histories of China and Japan. On the one hand, China enjoyed many advantages that facilitated rapid growth and permanent change. The country's knowledge about the world, which surpassed the knowledge of the Europeans for many centuries, also played an important role in this respect. But since China had no rivals and felt it was the world's most developed country, it also showed no inclination to implement reforms, which ended up leading to a difficult clash with European countries and their aggressive policy. In Japan's case, in turn, a deliberate policy of isolationism, which also meant that the country knew little about its external surroundings, contributed to the demise of its power and ultimately necessitated launching effective reforms.

Phase three:

This phase involves the subjugation of numerous poorly-developed countries in Africa, America, and Asia by European countries. The first countries to become colonial powers were Portugal and Spain (the 15th and the 16th century). In the period from the 16th to the 18th century, they were joined by England, the Netherlands, France, and Belgium, and in the second half of the 19th century by the United States, Italy, Germany, and Japan. In this context, we must not forget about Russia, which due to its geographical conditions created a different model of colonization, i.e. it did not have to subjugate overseas territories in far-away regions but instead took control of the vast neighboring areas. Such colonization was both peaceful (for example in Siberia) and armed (the conquest of the Caucasus). Colonialism changed the world to a fundamental degree by providing strong stimuli for development within the colonial powers, which on the one hand gained numerous resources and low-cost labor and on the other hand underwent changes in their systems of administration and implemented institutional solutions related to the industrial stage of civilization. Colonialism came to encompass practically the whole of the world – Africa, Australia, and New Zealand as well as Asia and America, especially South and Middle America.

Phase four:

This phase covers the period stretching from World War I, through World War II, to the failure of the socialist experiment. This period was characterized by full decolonization and the emergence of countries that adopted socialism, countries linked to the Soviet Union but also those that then formed Yugoslavia. The disintegration of the Soviet Union was a bloodless process, but the breakup of Yugoslavia entailed long-term armed conflict. The fourth phase put an end to the possibilities of geographical exploration and expansion, with most regions of the world being already discovered and described. There were very few tribes left that tried to retain their distinctive cultural identity by isolating themselves from their surroundings. Over time, however, this became increasingly difficult.

The fourth phase, or strictly speaking the end of World War II, also brought about changes in Europe. As the need arose to mitigate the threat of another armed conflict, the European countries chose to integrate, and since then they have pursued ever closer integration. The changes taking place in Europe are not only far-reaching but also new and unique. The European Union (EU), which is a result of these processes, is an important element of information society. Such solutions may be seen as a bridge to a new stage of civilization, as demonstrated by numerous integration projects in the world, which often emulate European solutions but are institutionally not as developed as the EU.

However, the institutional solutions linked to the new stage of civilization are already accompanied by a rather extensive technological infrastructure, including new communication systems and especially new substitutes for manual labor, such as robotization and artificial intelligence.

In conclusion, humanity's discovery of the world as a whole and acquiring knowledge about it has been a long process that still continues, but the world is nowadays already so well studied that we can assess relatively correctly both the benefits and the dangers that are entailed by the changes necessary from the perspective of the continued advancement of information society, the nature of current threats, the conflicts that exist between specific countries and may escalate, and the sources of internal conflicts.

4.2. Characteristics of elites and supporting groups

Development and changes are a common phenomenon on the global scale. However, the history of various countries, nations, or even continents teaches us that changes related to development are not merely positive or linear. These different positive and negative experiences have had various causes, but the decisive role, in our view, has been played by the nature of elites and the groups that support them.

When we analyze the past and present changes as well as the changes likely to take place on the global scale, we must always bear in mind that the stimuli for changes and their potential directions are shaped by political as well as intellectual and scientific elites, both temporally and territorially. Some see these directions as positive, others as negative. This results from the aforementioned universal principle holding that the nature of development is diversified, and this holds true for the development of various societies as well as groups and individuals. All extant documentation as well as historical information appears to show that important changes have always been spearheaded or inspired by individuals or larger groups, and in the modern-day world by different political parties. In this context, we should characterize these elites in somewhat greater detail and from different perspectives.

The first and most general division of elites relates to the nature of their activity. Here, we can list two key groups: political elites and intellectual elites. Without analyzing these two groups in detail, we can treat their key functions as the point of departure for further considerations. If we wanted to define the first of these groups in unambiguous terms, we would say that political elites determine the direction and methods of development, infusing its nature with a specific ideology. Essentially, it could be said that ideology in a sense determined the direction of development, and not the other way round. Without trying to define in a clear and unambiguous way the influence that the ideology professed by elites has had on development, we might only note that the negative impact of ideology has changed the world quite frequently, and the costs of these changes have been particularly high.

As for intellectual elites, their influence over development has been fundamentally different. This resulted on the one hand from the different roles that they played, and on the other from the differences that existed within specific groups. Intellectual elites can be generally seen as being of two different kinds.

The first of these comprises elites that wield fundamental influence over the broadly-understood social mentality thanks to the works that they create in the sphere of literature, music, painting, etc. Specific intellectual schools, or especially influential intellectual individuals, could be strongly linked to political elites of various affiliation. In turn, the latter kind of intellectual has always been linked to science and wielded special influence over development in the context of both technical sciences and some humanities. That said, it is hard to distinguish such a consolidated group within humanities – here, rather, we would probably have individuals or smaller groups linked to the political elite.

The activity of specific elites has precipitated changes on the scale of the globe or specific continents, not to mention specific countries, and the consequences of such influence has varied widely. We could argue over which group has had greater influence over changes and development: political elites or intellectual elites. We do not have sufficiently reliable metrics to assess this. Of course, such attempts have been made, but they were influenced by temporal changes that resulted from economic growth, the degree of innovation, the level of education, and perhaps above all the political model. In this context, we should only stress that some types of elites have had a destructive impact on development and changes on the scale of continents or even the whole globe.

When we try to classify the impacts that individual components have had on development or changes, we will come across numerous barriers that hinder this process. However, it appears that the political factor has had the greatest influence in the short or medium term. As a rule, political elites, backed by numerous groups representing diverse interests, carry out changes a lot faster than intellectual elites, which does not mean that these changes are always positive. Both past and present experiences offer numerous examples of such situations.

These considerations lead us to a single conclusion: without political and intellectual elites, the changes that have played out in different fields and areas, not to mention changes of a global scale, would not have taken place. In the conditions of peacetime, both political as well as scientific and intellectual elites set forth the main directions of change on the global scale.

4.3. Education and science

Of course, we could argue over which of the seven components presented above serves as the most powerful causative factor behind changes, both mental and real ones. If we wanted to measure change in the long-term and in all of the main spheres in life, we would say that this role is played by education and science. These two fields may overlap in many areas, but we should give priority to science.

If we look at the history of the world, especially in longer periods, considering both the agrarian stage of civilization and partially the industrial stage, we will see that large or even dominant parts of societies belonged to groups that had no or extremely limited contact with education. It was not until the industrial

stage of civilization reached more mature phases that education became universal, because that was necessitated by both the system of production and the functioning of the state. Education as a universal phenomenon was present chiefly in the economically developed countries. Its situation was not as good in the countries that relied on peripheral and imitative economic and institutional solutions linked to capitalism, which was seen as synonymous with industrial society.

Science played a different role, and this held true for both exact sciences and humanities. The former laid the groundwork for new solutions in the sphere of production, technology, and communication. Exact sciences created the framework and conditions for changes, which were initially quantitative and over time became also qualitative. Later, those were also developmental changes, linked chiefly to technological advancements, which changed the conditions of life and production as well as hard infrastructure. Humanities fulfilled different tasks: on the one hand, they showed visions of the world both in the present and in the future, sometimes even utopian ones, but they also sketched out the tenets of the future reality. But their main task involved changing the social mentality. That is because every change in terms of quality, production, or politics forces societies to alter their mentality.

In short, it is difficult to overestimate the role of education and science as important mechanisms facilitating development and by the same token also radical changes, regardless of the scope of this process. This is because this process has been evolutionary and diversified, not only globally but also across the scale of specific continents or even countries.

4.4. Technological advancement

With the arrival of the Industrial Revolution, the world started to change rapidly. Two important processes took place that changed the face of the world, though to different degrees and at different paces. First of all, human labor was largely replaced by machines, especially in the burgeoning industry. Secondly, cities changed in terms of their importance and characteristics and transformed into major centers of labor, causing people to migrate on a massive scale away from rural settings in search of work in the industry and in the service sector.

If we look at the industrial stage of civilization from the perspective of the influence of technology and science, we can list several important processes that changed the conditions of life for huge groups in society, which was not an easy process, at least for the first generations.

First of all, these changes included a fundamental change in the nature of labor. Factories demanded work that was rhythmical, timely, and – just as importantly – precise. Such labor differed completely from the work performed in agriculture, especially by owners of small farms.[6]

[6] In this context, it is worth noting that this process was coupled with the simultaneous emergence of the modern-day system of education, which operated based on similar principles, with schools working in similar ways as factories. Schools were expected to teach students to

Secondly, cities imposed a relevant system of norms, or dos and don'ts. New, previously-known institutions emerged that regulated the principles of conduct in cities, which differed substantially from life in rural areas, at least initially.

Thirdly, a new system of transportation developed slowly thanks to the presence of post offices, telegraphs, and telephones as well as the use of steam locomotives. At the same time, rail enabled to people to move about relatively rapidly and look for jobs outside familiar settings.

Fourthly, education gradually became mandatory, at least at the level of primary education. Thanks to this, talented young people could pursue further education at higher levels. This situation was conducive to the development of technical education at primary, secondary, and tertiary level and was fostered above all by demand on the part of the burgeoning industry.

Fifthly, the free-market economy started to develop on an ever-broader scale, thus fundamentally transforming attitudes towards economic activity and prospects of advancement as part of this system.

Sixthly, cities created possibilities for establishing numerous contacts in different associations, ranging from sports associations through unions (including labor unions) to political parties. Such opportunities could be more realistically explored in major urban agglomerations, but smaller towns also offered chances for further development, better jobs, and the establishment of numerous contacts. In any event, urban migration from distant rural areas offered truly great opportunities, especially for the brave.

In short, technological advancement has gone hand-in-hand with fundamental processes of change in terms of the role of human labor and for the gradual but unabating rise of major urban centers.

4.5. Characteristics and nature of economic and territorial expansion

The relatively rapid dissemination of the market economy became one of the most important characteristics of the industrial stage of civilization in the economic sphere, with the market becoming a major regulator of production. Demand and supply became the main mechanisms determining the ups and downs of production, in addition to regulating prices, especially in the liberal political model.

Another important characteristic of the market economy is the constant pursuit of expansion, whose main goal is to gain control of not only the internal market in what is the country of origin for the production and the owner of the enterprise, but also external markets. This is tantamount to the "seizure" of foreign territory in a relatively peaceful manner. Those fighting for their position in the market competed chiefly on price and product quality. External expansion became

be punctual and to work according to schedule (with sharply fixed lessons and breaktimes), rather than based on the former style of lectures, delivered by masters, with no time limits – they had ended when the topic was exhausted, not when some school bell started to ring.

a necessity, because growing demand in the internal market was coupled with the emergence of new enterprises, whose owners wanted to amass fortunes by modifying sought-after goods and manipulating prices.

Although competition, whose goal was to claim an ever-growing part of the market, both internally and externally, was peaceful, the early stages of market rivalry were characterized by various conflicts, sometimes even armed ones. As we stated before, important forms of external expansion included colonial conquests, especially those made by powerful or highly-developed European countries. The dissemination of the market economy was gradual and effected both by peaceful means and by means of armed combat not only in the areas dominated by the industrial stage of civilization but also in those dominated by the agrarian stage.

The market economy not only created conditions for the appearance of new types of products but also promoted technological advancements, which completely transformed the key production resources of the new stage of civilization (thus gradually changing public mentality), including in particular the new type of labor in industrial facilities. In this way, the market economy became one of the most important mechanisms of development.

4.6. Armed conflicts as a major driver of change and development

Since the beginning of the development of mankind, armed conflicts have been a persistent and more importantly ever-growing phenomenon. In this respect, we could formulate the following interdependence: the higher the level of development of a given society, the more dramatic the conflicts it experiences in terms of both the number of casualties and changes in the territories occupied by the participants in these conflicts as well as material damage. Wars may and do have widely varying sources. We will not attempt to present a detailed breakdown of such causes here, but will instead focus on the several past centuries so as to distinguish several types of wars that had overwhelming influence over changes and development.

We should start off by recognizing **religious wars**. In the 17th century, they were an important prelude to the emergence of the industrial stage of civilization as well as sovereign nation states, especially in Europe (this model of the state has remained valid until the present day). The model of the sovereign nation state continued to crystallize throughout the Napoleonic Wars, which transformed completely the feudal or post-feudal models. The 19th century witnessed the beginnings of **revolutionary wars**, with the Paris Commune serving as the prototype for such conflicts. Also noteworthy were the Bolshevik revolution in Russia and the civil war in Spain. **World Wars** I and II were of a different nature and ranked among the most important conflicts in terms of their scale, the number of the countries involved, the casualties, and the consequences.

This list of wars or types of armed conflicts is not exhaustive, but we should also mention **conflicts resulting from the breakup of countries**. These include

the armed conflict linked to the breakup of Yugoslavia as well as various wars resulting from decolonization, which have in practice continued until the modern times. They have been linked both to religious conflicts, partly similar to the religious wars in the 17th century, and to ethnic conflicts, as ethnic groups very often find themselves divided by boarders drawn without any heed being paid to the ethnicity of inhabitants.

Wars entail numerous consequences, but among the most important ones are territorial shifts. New countries emerge, some of which did not exist before. Others change their territories, as was the case after Italian unification and the status changes of Singapore and Hong Kong, not to mention the importance of the breakup of the Soviet Union for the emergence of sovereign states.

Wars have had an equally important impact on technological advancements and the mental development of societies. It would be hard to list all the inventions that were inspired by the activity of the military sector and were partially applied in the civilian sector, but they ranged from nuclear fission and the development of aviation to flights to the moon, nanotechnology, and many more.

Wars have also had an overwhelming influence over mental changes in numerous societies, both the winning ones and those who were defeated. New alliances were formed, but hatred continued to escalate. Wars have given rise to both positive and negative changes.

4.7. The human, intellectual, and economic contributions that the previous stages of civilization have made to ongoing processes of change

This problem, an extremely complex one, has essentially not been analyzed in detail before, with the contributions that specific segments made to changes and development having been scrutinized and analyzed rather randomly. This results not only from the complexity of the world as a whole but also from the differences between specific segments in the context of both continents and countries. For this reason, we have decided to point out several contributions that we consider particularly important for development and by the same token changes, not only those of a fundamental nature.

First of all, each consecutive stage of civilizational advancement is based on certain fundamental components that the past brings to lay the groundwork for further development. Such contributions include above all human capital along with its size, education level, and creativity, as well as the dominant mentality. This capital is greatly dependent on the size of the population and its characteristics. Development entails constant growth in population numbers, but this growth is not distributed evenly across time or space.

Secondly, the segment related to the flourishing of cities and hard infrastructure contributes to development in an equally important way. Its significance is linked to its durability, which often stretches beyond the following stages of civilization. More importantly, its role continues to grow, not only as

a result of the migration of people from agriculture to the industry and the service sector. Although some types of production disappear and the nature of services changes, they are replaced or indeed even succeeded by new products and services that originated in the past, but their massive scale belongs to the new phase of development. This is also a manifestation of the continuity between the past and the present and partially also a prelude to future development.

Historical experiences teach us that numerous concepts and ideas that could not be put into effect in the past provide an important impulse for change in the subsequent phases of development both locally, continentally, and globally. This fact results from the imitative nature of development, which is a certain universal rule that applies to practically all stages of civilization, including the ones that are yet to come.

Thirdly, these permanent components or even segments that are changing the world include different ideas, ideologies, and views that are initially professed or supported by individuals or small groups and over time begin to influence politics, interpersonal relations in certain societies or countries as ideologies that go beyond the borders of specific countries. Such ideologies sometimes affect positively interpersonal relations and the emergence of such institutions as democracy as a model and an ideology, whereas others have a negative impact on state institutions, the examples being Bolshevism and fascism. At the same time, there are many different ideologies, both positive ones, which stem from the general structure of democracy and include ethnic, religious, and moral tolerance, and negative ones such as nationalism, ethnic favoritism, racism, and so on.The diversity of these ideologies has a huge impact on changes, not only within specific countries but also globally.

This segment has played an important role in the past, and it also affects in a significant way the interpersonal relations in the modern-day world. It will most likely also have great importance in the future, especially in light of modern communication systems.

4.8. Summary of the seven-way configuration of change-driving factors

If we regard all the components of the seven-way configuration of factors as a model of changes in the historical process of mankind's development, we will see that all of them have affected development, but to very different extents. In most cases, such changes were positive, but we must not omit the negative processes.

If we look at all these changes in a comprehensive way, we will see that development and related changes are not linear but have a very sinusoidal nature at all levels: individual countries and continents as well as the whole of the globe. This brings us to the conclusion that development-related changes will have a similar nature also in the future, and we can already see this in the present-day world.

5. The impact of globalization on the changing world

Globalization may be seen from two perspectives. On the one hand, this phenomenon has a very long history, because integration and interaction, whether peaceful or conflict-driven, have always been present in the world. Such processes are caused by economic, political, technological, and partly also social factors. The first acceleration of globalization processes was coupled with geographical discoveries, which on the one hand broadened visions of the world and on the other led to the establishment of the first political and economic ties with the newly-discovered lands, most of which became colonies, chiefly of the European countries.

Before we present the mechanisms and consequences of modern-day globalization processes that have a significant or even decisive impact on the changing world, we feel it is crucial to point out how in the past globalization processes were partly reversible – unlike modern-day globalization, which is more likely than not to intensify, at least in the nearest century. It appears impossible to slow down such changes, let alone to reverse them. Before we attempt to provide broader arguments to justify this hypothesis, we should mention two opposing processes that took place in the late 1980s. That was when on the one hand full decolonization came to an end and on the other one globalization processes grew in intensity, sparked off chiefly by economic and technological changes.

The notion of permanent and ever-more intensive globalization processes is apt when we look globally, not in the context of individual countries, especially small and medium-sized ones. Such countries are characterized by relatively low or limited population and economic potentials, which means that the globalization processes there may have and often have both positive and negative consequences.

What is globalization, then? The answer is both simple and extremely complicated, because globalization on the one hand boils down to integration and on the other one triggers numerous contradictions that existed in the past as well as creates new ones that were previously unknown or insignificant. We will not go into great detail here, but will limit ourselves to listing the following components and mechanisms of globalization:

1. The universal nature of the market economy, despite the fact that its manifestation in specific countries is diversified in terms of both scale and scope.
2. The ever-deepening international division of labor, which has caused foreign trade to take on special significance in the process of growth.
3. The growing role of the movement of goods, services, and capital has led to the emergence of new economic and financial entities such as multinational corporations and financial markets. These often seem to be interfering in the internal activity of specific countries, not only in the sphere of economics, which in many countries leads to certain powers being taken over by such new entities.

4. Globalization has led to the emergence of international institutions that have a significant regulatory impact on trade between countries, the flow of investments, and financial markets.
5. The factors that proved particularly conducive to globalization processes were technological changes related to the Information Revolution, with the resultant informational flow revolutionizing not only the availability of information but also the rapid pace of its exchange, not to mention visualization-related processes.
6. Globalization favors the emergence of new institutions such as integration--based organizations. The most developed form of such institutions is the EU, but many integration-based organizations of an economic nature already exist, on all continents at that.
7. In the context of the consequences of globalization, we may not omit to mention the emergence of new economic powers, which came into existence in a relatively short time span (the past three decades), such as China and to a smaller extent also India.

In the context of the changing world, globalization may be approached from the perspective of both its positive and its negative aspects. There is no arguing that globalization is one of the most important modern-day mechanisms of changing the world.

Positive globalization processes include: first of all, growth in GDP on a global scale; secondly, revolutionary changes in technology, especially communication systems; thirdly, positive economic, social, and educational changes in many countries of the world; and fourthly, the possibilities of exploring the world and easily moving across the globe.

As for the negative processes and changes, we can list especially the rapidly growing income differentials on the scale of specific countries and continents as well as the whole globe. Further, the list includes above all rivalry between major powers as well as their supporters and allies, chiefly those that rank among small and medium-sized countries. Finally, there are the fierce fight over resources and rivalry over new technologies.

Such diversified interests are pursued against the backdrop of conflicts of different degrees of visibility between small and medium-sized countries resulting from the past events and from the cultural systems of such countries.

In the context of these considerations, we feel obliged to posit the following question: **How is globalization affecting the volatility of the world?** It is difficult to answer this question in an unambiguous way, because we cannot measure the pace of change in an objective way, nor can we compare the modern-world with previous periods in history. However, based on observations of the world around us, we can see that changes have accelerated rapidly over the past decades. This may be due to a range of factors, but the particularly powerful ones appear to include the opening up of the world. On the one hand, this process was caused by globalization, especially in the economic sphere – initially, in the form of easier international trade

and later in the form of changes in factors of production and easier capital flows. However, we must not forget all these things would not have been possible without globalization in the flow of information and ideas, which brought about political transformations in the world. Here, we should mention above all the reforms launched in China in 1976 after Mao Zedong's death as well as the fall of the bipolar world as a result of *perestroika*, the breakup of the Soviet Union, and the transformations in the former socialist countries, also those outside Europe.

Globalization, through the increased visibility of the Western world and lifestyle, has contributed to changes in the life of a significant share of the population. A certain feedback mechanism could be observed here, with the political transformations making it possible for inhabitants of the countries experiencing them to travel abroad, especially to culturally different areas, and thus also to learn more about the world as well as the needs and lifestyles of people living in other countries. This, in turn, brought about eagerness to follow a similar path of development to attain the Western lifestyle, at least in terms of wealth. Consequently, a certain self-propelling mechanism emerged that could be initially set in motion only through the easier exchange of goods, but soon also through imitation of existing innovations and later through their further improvement. The roles became partially reversed, and the flow of goods contributed to the development of technology, with a crucial role being played by information and communication technologies.

Facilitating the flow of information results in the development of new technologies and possibilities for people. Globalization has led to the dissemination of information technologies and the Internet, which have significantly altered the face of the world's economy. Examples include the outsourcing of production and services, which is currently a common practice. Such a situation on the one hand leads to the reduction of the costs of doing business and on the other one creates barriers or even conflicts in the relations between customers and manufacturers. Simultaneously, communication technologies affect methods of working. Visionaries have long pointed out the scale of possible changes leading to the emergence of a new type of society whose members will not be forced to function according to existing rules, i.e. commute to work every day and perform their tasks at specific hours. The possibility of following such a path of development has been tested extensively during the COVID-19 epidemic, with workers in many countries being forced to work remotely. Practice has shown that such work is by all means possible. In many cases, it has been received quite favorably.[7]

[7] This involuntary experiment will surely be the subject of many studies with interesting conclusions. Opinions on this issue are divided. On the one hand, people have noticed that remote work is possible and sometimes even more effective than in-office work, because they are more focused on the tasks at hand. In addition, those who spend an hour every day commuting to and from work started to benefit from an extra 10 hours of free time a week. On the other hand, remote work requires certain discipline, which may be hard for those who are not used to organizing their work by themselves. Moreover, such additional burdens as the

Irrespective of how we look at globalization, it is one of the most important processes behind development, and it causes the world to undergo profound change, both positive and negative. It is difficult to say which of these processes prevail, because they have not continued long enough to allow us to make accurate estimates. We will return to this topic after we analyze the transitions from one stage of civilization to another that we are currently witnessing.

6. Change in the period of the ongoing transition to a new stage of civilization

We live in an era that could be described as an inflection point in the advancement of civilization. In practice, we can observe two completely different civilizational turning points taking place in the modern-day world. The first of these involves the transition from industrial to post-industrial (information) society, and the second could be referred to as the degradation of agrarian society.

Such a clash is something unique and previously unknown. This entails special and not always positive consequences for development processes, especially those that change the face of the world in the long-term.

It appears that special importance should be attached to what are highly diverse goals pursued by specific regions and countries, which follow not only from the fact that they are at different stages of the advancement of civilization but also from the existence of a huge temporal gap in their development. It becomes especially visible when we compare such countries as the UK and Switzerland with most of the countries in the central part of Africa.

If the transition from the industrial stage of civilization to information society is a certain historical necessity, because the conditions for this change already exist (chiefly technological and economic but partially also mental ones), the transition related to the degradation of agrarian society raises certain doubts. Such doubts can be expressed in the form of the following question: **Is it possible to skip over one stage in the advancement of civilization, jumping instead into the next, more developed stage?** No existing theory of civilization, of all those posited in sociology, philosophy, economics, and political science, has provided us with an answer to this question. We could even go one step further and presume that this question, as such, has ever really been asked.

But it must be asked for at least two reasons. First of all, the modern-day world is a complex system of intertwined phenomena, and now this is more true than ever before. Secondly, some of the modern-era novelties reach the

need to look after children, which were also forced to learn remotely or share their Internet connection (whose quality is not always sufficient) with other members of the household, led to difficulties that made it harder to assess such solutions objectively.

economically or politically least developed countries, but these novelties are not always limited to positive processes and include to a significant extent also negative phenomena. Decolonization did not mean a rapid transition to modernity or prosperity.

If the need arose to answer the question of what stage of civilization we are currently living in, the answers would differ depending on who we asked and where. **The modern-day world is, in fact, an amalgam of three interlocked stages of civilization with different population, economic, social, and political potentials**.

There is no doubt that if we adopted population as the criterion, we would see that the dominant part of the world's population is still at the agrarian stage. This applies chiefly to Africa and to a large extent to Asia, but this stage of civilization is also dominant in some areas in Middle America. In turn, the industrial stage is the dominant stage of civilization in Europe, North America, and certain regions in Asia (Japan, South Korea, and China, which are characterized by a mixture of the agrarian stage and the industrial stage, along with certain rather well-developed components of information society), as well as Australia and New Zealand. In North America, just like in Europe, the post-industrial stage is already developing in a significant way, but the degree and pace of this development remains highly diversified.

Such briefly described and diverse characteristics of civilizational turning points show how much the world is changing, because these processes have taken place over just the several past decades, although the beginnings of information society were visible in some countries even earlier.

The modern-day world is not just ethnically and culturally diversified. Importantly, it is also characterized by a mixture of different stages of civilization. This situation has far-reaching consequences that manifest themselves in contradictions, both those that are legacies from the past eras and the new ones, which are effects of the recent decades.

We will not attempt to present a hierarchy of threats or contradictions or present them all, but will nonetheless list those that are especially important for the modern-day world.

6.1. Changes in the list of the countries dominating different stages of civilization

In agrarian society, we can list different dominant countries depending on the period. Here, we should mention Egypt, the Persian Empire, Alexander the Great's state, and in particular the Roman Empire. The peaks of their dominance came at different periods of history. In the industrial stage of civilization, in turn, the dominant country was the UK, followed later by the United States. The Soviet Union was also considered as one of the world's powers and one of the countries that exerted their dominance in the bipolar balance of power during the Cold War.

It is difficult to say which countries will hold dominant positions in the information stage of civilization. That said, the emergence of two such entities is visible from today's perspective. The first is the United States with its established presence as an economic, military, and political power. The second is its ever-stronger rival – China. The pace of change in China's economy and politics is enormous, even unprecedented. In just three decades, China has turned from a country with a very low level of development into a power that is successfully competing against the United States and has even surpassed it in some aspects. Consequently, the rivalry between these two entities is growing, and its intensity is so great that many commentators are already calling it a new "economic war", likening it to the Cold War. In fact, its consequences may be much more far-reaching. It appears that this conflict is no so much a race as a war of attrition. It is quite likely that it will play out on completely new levels, with cyberwarfare being one of the numerous new fields of rivalry. Despite having numerous advantages, such as being very advanced in building the post-industrial economy, the United States is struggling to retain its position, and these efforts appear ultimately fated to fail. This belief results from the changing conditions, which have their source in the combination of civilizational turning points and globalization. What is more, China as a country that is pursuing expansion often makes use of the latest fruits of development, thanks to which it appears better adapted to facing imminent challenges. China's advantages include: a greater capacity on the part of the authorities to acting adaptively in rapidly changing conditions, a better understanding of the importance of environmental threats, and a society with a more disciplined approach shaped by cultural conditions. All in all, this rivalry offers yet more evidence that change is a continual process.

6.2. Political changes in the world

Industrial society created its main political model in the form of liberal democracy. This is a model that has so far provided the broadest rights and freedoms to citizens. Nevertheless, the past three decades have also witnessed ever-growing autocratization, or a change of regime towards limiting freedoms while still maintaining elections. This process was initiated in the 1990s. Strong economic performance on the part of such countries as China and Singapore shows that the system of government referred to as authoritarian developmentalism can compete with democracy, especially in societies that are culturally accustomed to the authoritative role of government.

At the same time, we can notice a certain distortion of democracy caused by the excessive influence of non-democratic forces. This process may result from the dominant role of the media (mediacracy) or capital (plutocracy). Such a situation leads indirectly to a decline in public trust and the development of populist and nationalist movements.

In 2019, for the first time in thirty years, fewer than half of the world's countries were categorized as democracies (a drop from 58% to 48%), with some

2.6 billion citizens living in countries ruled by autocrats and their parties. The crisis of democracy is growing worse, and it is difficult to say with all certainty what political model will prove dominant in the digital stage of civilization. It is possible that a new, hybrid solution will be created on the basis of the existing systems of government, but note that given the ongoing development of information systems, political decisions are made increasingly on the basis of not only national interests but also public approval, even if these decisions might be ill-advised. This applies to both democracies and authoritarian regimes. The latter, admittedly, have greater latitude to act, but also have to take into account public approval for their actions.

6.3. A new social structure

Each stage of civilization is characterized by its own distinctive social structure, despite the fact that certain solutions are taken over from the previous stage. A social structure crystallizes under the influence of developmental changes, creating social bonds of a new nature and often also changing the relations between particular groups, especially as a result of changes in production and technology as well as political transformations. New hierarchies and barriers appear, and so does distance between individual social groups.

Since the conditions for the transition to the digital stage of civilization are already evident, we can say clearly that changes in the social structure are already taking place. They are present in both civilizational turning points and pertain to numerous economically developed countries, but they have been also observed in developing countries. Here, we can list first of all the disappearance of certain types of professions and secondly the emergence of numerous new professions in the field of new technologies such as automation, robotization, artificial intelligence, and so on. They constitute strong competition to the traditional workforce. Thirdly, it is possible to observe the breakdown of family as a basic social unit. Fourthly, a new class has emerged that is referred to as the “precariat”. Fifthly, the ruling establishment has been growing steadily, both nationally and internationally. This applies in particular to the civil service, the task of which is to ensure the proper functioning of the government institutions.

As the social structure changes, new authorities and new values emerge, and so does a new language that is often incomprehensible to those who adhere to traditional values. Such changes lead to numerous conflicts between the traditional social structure and the modern one, which in turn upsets the existing political and social order. Tensions emerge both within societies and in the relations between them.

The scale of these processes is unknown and impossible to estimate. Emphasis is usually placed on the changes taking place at the individual level, i.e. the breakdown of the family, the development of liberalism and egoism as values that take precedence over cooperation and compromise. Single-parent families,

cohabitation (arrangements where people live together without being formally married), and aversion to forging any relationships are slowly becoming the norm. These changes may also lead to institutional transformations, for example through the establishment of new states. One reaction to globalization comprises its exact opposite, namely growing fragmentation. It may assume both well-known forms, such as Catalonia's bid to break away from Spain, and previously-unknown ones, such the emergence of countries without territories (based on cyberspace) or operating according to different rules.

6.4. Booming population growth

One of the most important threats, especially in the context of the future, is posed by the booming population growth that we have witnessed since the beginning of this century. Existing technological advancements, especially the industrialization of agriculture, have ensured relatively easy access to food, which resulted in rapidly rising population numbers. Forecasts show that this trend is slowly leveling out, but the growth itself remains very rapid, which gives rise to fears over humanity's ability to obtain food, secure conditions for development, and prevent an environmental disaster.

According to UN data, the world's population is expected to rise steadily until 2100, with the detailed forecasts being as follows: 6.143 billion in 2000, 7.379 billion in 2015, 9.735 billion in 2050, 10.577 billion in 2075, and 10.875 billion in 2100 (UNDP 2019). Population numbers are projected to rise at the fastest rate in Africa and Asia, whereas Europe is expected to record a negative growth rate before 2050.

What are the consequences of such forecasts? The first and foremost one follows from the fact that this booming population growth will be centered mainly in the least developed continents. We can assume with a high degree likelihood that the economic potential both in Africa and in Asia will not be sufficient to ensure relatively satisfactory growth in the wellbeing of most people. This, in turn, means that people will make more intensive efforts to migrate to other, more developed continents, chiefly Europe. This will trigger numerous conflicts, a foretaste of which Europe has already been given. Rapidly growing population numbers may nonetheless lead to fiercer conflicts, and that is something none of the developed continents are prepared for.

Based on the experience so far, it is difficult to assume that assistance from the developed countries will be sufficient to effectively resolve the escalating population problems faced by Africa and partially Asia.

This is one of the most important problems to be resolved on the global scale. As yet, however, the world is not prepared for doing so, financially or mentally.

6.5. Climate warming and the degradation of the natural environment

Population growth and the advancement of civilization, including the rise in consumption, have caused the anthropogenic stress on the environment to grow steadily. The most visible sign of this situation is climate change, which is advancing more or less in accordance with the models presented by researchers, who warn against its destructive consequences. Currently, the scale of changes is large enough to be felt by people without the need to conduct specialist measurements. The changes being observed have already caused significant costs for humans and the natural environment.

That said, very few tendencies to introduce political changes and effective prevention measures are noticable. Existing solutions, such as the Paris Agreement,[8] are inadequate to the situation or are not put into effect. Such a position results from the need to conduct substantial changes in the methods and scale of consumption and the organization of state policies (a change of priorities in tax policy).

In the modern-day world, characterized by a more or less open plutocracy, economic changes – i.e. placing the financial responsibility on high-emissions sectors of the economy and restricting their freedom of doing business on the one hand and limiting consumption on the other – are nearly impossible to carry through, because they entail that political candidates will lose the support of certain economic entities and the media (which are usually closely interlinked). By the same token, any political camp that tries to introduce such changes is automatically at a disadvantage. The effects include feigned reforms, and even more experts are being employed for eco-marketing activities solely aimed at improving the image of high-emissions sectors.

Against this backdrop, anti-change moods are being fanned and scientific evidence is being called into question, through the creation of alternative analyses in line with specific policies. Such studies and skeptical groups are utilized by the governments to continue policies that do not require any considerable engagement. There are precious few exceptions to this rule, including the EU and China, which are pursuing long-term and increasingly strict climate policies. However, as we mentioned before, climate change belongs to the fourth, global level of security problems, so the effectiveness of the efforts to resolve them depends on the attitudes on the part of the dominant majority of countries and people. Currently, we can see no indications of such changes in the foreseeable future.

However, the problem chiefly boils down to the fact that climate warming and the degradation of the environment are irreversible, especially if we link them

[8] This refers to the deal signed at the United Nations Climate Change Conference (COP21) in Paris on 12 December 2015. When the document was signed, it was argued that it represented a significant success in the fight against climate change. In practice, its publication was immediately followed by numerous opinions expressed by experts who pointed out that the deal lacked binding commitments and the existing ones were rather vague.

to the booming population growth and the very rapid development of cities and hard infrastructure. At the very best, we can only mitigate or minimize these processes.

7. Conclusions

The brief exploration of changes we have presented above is by no means an exhaustive list of the contradictions plaguing the world, but the factors that have taken into account do nonetheless allow us to draw certain simple conclusions. Namely, first of all, change is a perpetual element of human civilization. The only difference lies in the pace of change, which continues to accelerate. Secondly, globalization is not the only factor affecting change, and this makes it hard to separate its effects from the impact of other factors. In many cases, it surely serves as a catalyst for change and should therefore be observed very carefully. That said, the source of such changes is usually independent of globalization, and they would have probably taken place even without it yet at a much slower rate.

Thirdly, the world is currently transitioning in terms of civilization. Each such transition has marked an important turning point, and this also holds true for the ongoing ones. The current situation in the world is somewhat chaotic, with nervous moves and changes being made, their direction not always evident. This often leads to a sense of uncertainty or even helplessness in the face of the processes taking place in the world. The tensions accompanying changes are many times greater. We can see no end to this process, so the coming decades will likely be marked by change and uncertainty, and we should not expect the crystallization of the new stage of civilization to cause the process of change to slow down or stagnate. Its pace will most likely remain the same.

Against this backdrop, we feel we should point out some of the particularly dangerous threats that partially stem from the past, but the present has modified them to a significant degree. What serves as our point of departure here is the process that could be described as **chaos in the conditions of civilizational transition**.

Such turnings points have happened in the past, but they have never been so manifestly chaotic as they are now. This results from two important facts: first of all, the pace of developmental changes in both the emerging new stage of civilization and the degradation of the agrarian stage is particularly rapid; and secondly the transformations are taking place concurrently irrespective of the characteristics and the level of the space in which such changes occur. What are the manifestations of this transition-related chaos? We can list three particularly important ones:

1. Processes upsetting the existing political and institutional order.
2. Disruptions in the regularity and sequential nature of change in the fundamental components of civilization.

3. Numerous groups in society, which at least *en masse* are not mentally prepared for the profound changes brought about by a transition from one stage of civilization to another.

The mentality of society as a barrier to development changes is an important component determining both development and the mutual relations between the groups that form a specific community. It determines numerous solutions, both political and economic ones. This is not the place to go into detail on the factors that affect mentality; we will instead just mention here first of all the cultural system that is dominant in a specific country or part of society, secondly the level of prosperity, especially income and social differentials, and thirdly the policy pursued by the state and its political model. The societal mentality is a relatively permanent factor, but it nonetheless undergoes certain changes, though they are much slower than other components that affect development. Simultaneously, the societal mentality is largely dependent on the dominant cultural system, whose components are likely to generate conflicts to a greater or lesser extent, and this becomes especially visible in periods of changes. In such situations, what we can observe in a specific society is a process that could be referred to as the splitting of mentality, which may manifest itself in both political and social regression. In the conditions of civilizational transition, such phenomena as a rule make themselves manifest, escalating differences in a given society and having a quite significant impact on its internal and partially also external policy.

Another important change-related process, especially during the current transitions to new stages of civilization, is **the degradation of the traditional model of the state that emerged in the industrial stage of civilization**. The most important characteristics of the traditional model of the state have always included the sovereignty of deciding about model solutions, the nature of the institutions, the relations with other countries, and so on. The main mechanisms of such degradation are the common nature of the market economy and its new entities: multinational corporations, international regulatory institutions in more or less specialized fields, as well as integration organizations. The latter have so far assumed very different forms, the most mature one being the EU. What are the signs of such degradation? Generally speaking, they include the taking over of certain powers by external institutions. The scope of such delegated authority varies greatly. Although the benefits from this process are numerous, they are viewed unfavorably by numerous social groups, especially certain politicians or parties.

Important manifestations of civilizational turning points have included not only full decolonization but also the emergence of new countries, both those that had existed in the past and the newly-formed ones. A new-old type of differences emerged **between small and medium-sized countries both in Europe and in Africa and Asia**. In the not-so-distant past, small and medium-sized countries functioned chiefly in Europe and their external links were limited for political and economic reasons, but this situation changed to a fundamental degree in the period of decolonization, especially in the last decade of the 20th century both in Europe

as well as in Asia and Africa. This is not only because we currently have over 200 formally independent states but also because the statehood of many of them is still taking shape, which leads to different conflicts, often of an armed nature. This holds true for Africa as well as partially Asia. The sources of these conflicts vary greatly. In Europe, they are linked to sovereignty issues as well as political, cultural, and religious affiliations. On other continents, they are coupled with territorial, religious, and political problems.

What poses the main problem, however, is the growing dependence on the countries that wield economic and partially also political influence over the globe. Such countries shape the world order to a smaller or greater extent, thus forcing smaller countries to follow their goals. In this context, we should point out the problem of religious warfare. If such conflicts lay at the source of the industrial stage of civilization and led to the division of Christianity into Catholicism and Protestantism, then the question remains: will we witness another such religious war on the brink of the transition to information society and if so, then what could the nature of such a war be?

The conflict within Islam: a war between Sunnis and Shiites. This armed conflict has continued for nearly two decades, despite having a much longer history. The emergence of numerous countries where Islam is a dominant religion created conditions for the escalation of this conflict. It cannot be ruled out that religious differences will drag some countries into regular warfare, especially as the Islamic countries are characterized by very high rates of population growth. Another conflict that emerges against this backdrop is the problem of refugees, who decide to flee conflict-stricken regions and migrate not to culturally similar countries but to wealthy societies, where they have greater chances of finding employment and living in better conditions.

The above considerations lead us to consider a more general issue: **Might booming population growth not lead to a new war, much broader in scale, in the near or far future? This is because refugees will have difficulty finding adequate space for themselves, will not be able to find employment, and will not be accepted by the local communities in their destination countries.**

Such a possibility cannot be ruled out. There are, we believe, two factors arguing in favor of it. The first is linked to the existence of two military and economic powers, namely the United States and China, which are engaged in an ever-more intensive rivalry. More importantly, this rivalry may escalate into a confrontation, not only a peaceful one, as is currently the case, but also a military confrontation. The second comprises great economic and political diversity of an intercontinental nature, which may also provoke different conflicts, possibly also military ones.

Finally, we cannot rule out other threats, such as the ongoing COVID-19 pandemic, which do not create conditions for positive change but most likely foster negative ones. The international community may be even forced to take quasi-forceful measures that will have a positive impact on development in the

future, on the international scale at that, although this development will most likely not be evenly distributed.

All in all, we believe that our final conclusion may be as follows: the world is experiencing rapid change whose positive and negative consequences will be faced by the whole of the world's population, and will entail a shift in the degree importance that specific countries or even continents have enjoyed in the recent past and enjoy in the present. But such is the logic behind a civilizational transition.

At the same time, we must point out that many of these changes, even those that are global in their nature, do not follow directly from globalization but from other factors that occurred earlier or are independent of globalization. Globalization only speeds up their pace or facilitates the flow of information, thus making it easier for us to recognize such factors, but it does not generate them. In some cases, such as global threats to the natural environment, globalization may be a tool for helping to resolve the problem, or setting directions of changes, but the factor behind change (in this case, the occurrence of global threats through the increased intensity and scale of local threats) would be independent of globalization.

Bibliography

Allison, G. (2017), *Destined for War: Can America and China Escape Thucydides' Trap?* Mariner Books.

Atkinson, A.B. (2015), *Inequality: What Can Be Done?* Cambridge MA: Harvard University Press.

Baldwin, R. (2016), *The Great Convergence: Information, Technology and the New Globalization*. Cambridge MA: Harvard University Press.

Bauman, Z. (2016), *Strangers at Our Door*. Cambridge: Polity.

Beyer, P. (1994), *Religion and Globalization*. Sage.

Bordo, MD. (2010), The Second Era of Globalization is Not Yet Over. In: *Historical Perspective*, Working Paper nr 319, Hamburg, Germany.

Braudel, F. (1995), *A History of Civilizations*. A Lane.

Chołaj, H. *Ekonomia Globalizacji* [Economics of Globalization]. Fundacja Innowacje, Wyższa Szkoła Społeczno-Ekonomiczna, Warszawa.

Cieślik, A., Michałek J.J. (eds). (2014), *Niedoskonała globalizacja* [Imperfect Globalization]. UW Warszawa.

Czerny, M. (2005), *Globalizacja a rozwój: Wybrane zagadnienia z geografii społeczno-gospodarczej świata* [Globalization and Development: Selected Issues in the Socioeconomic Geography of the World]. Wydawnictwo Naukowe PWN.

Golka, M. (2012), *Globalizacja współczesna i globalne problemy* [Modern Globalization and Global Problems]. Oficyna Naukowa, Warszawa;

Kaper, S. (2006), *Multinational Corporations and the Erosion of State Sovereignty*. Illinois University.

Kler, J. (1999), Europa XXI wieku: Między globalizacją a regionalizacją [Europe of the 21st Century Between Globalization and Regionalization]. In: *Jaka przyszłość Europy* [What Future for Europe?]. Komitet Prognoz "Polska 2000 Plus" PAN, Warszawa.

Kleer, J. (2006), *Globalizacja a usługi publiczne* [Globalization and Public Services]. Komitet Prognoz "Polska 2000 Plus" PAN Warszawa.

Kleer, J. (2008), *Globalizacja w warunkach różnych cywilizacji* [Globalization under Conditions of Different Civilizations]. Zeszyty Naukowe nr 6, Polskie Towarzystwo Naukowe, Kraków.

Kleer, J. (2016), *Przesilenia cywilizacyjne* [Civilizational Transitions], Studia Ekonomiczne nr 1.

Kleer, J. (2017), Uniwersalne prawidłowości różnicujące świat [Universal Rules Differentiating the World], in: *Zróżnicowanie dochodowe i społeczne Europy* [Income and Social Differentiation of Europe]. Komitet Prognoz "Polska 2000 Plus" PAN, Warszawa.

Kleer, J. (2018), Czym jest współczesne państwo? [What is the Modern State?], in: *Państwo w warunkach przesileń cywilizacyjnych* [The State Under Conditions of Civilizational Transitions]. Komitet Prognoz "Polska 2000 Plus" Warszawa.

Kleer, J. (2019), System kulturowy a rozwój [Cultural System and Development]. *Nierówności a Rozwój* nr 59/3.

Kleer, J., Kleiber, M. (2016), *Global Treats as Barriers to Development*. Komitet Prognoz "Polska 2000 Plus" Warszawa.

Landau, A. (2005), *The International Trading System*. Routledge, London-New York.

Landes, M. (1998), *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor*. New York: W.W. Norton

Maslow, A. (1943), A Theory of Human Motivation. *Psychological Review.* 50 (4): 370–396. doi:10.1037/h0054346.

Milanonovic, B. (2016), *Global Inequality: A New Approach for the Age of Globalization*. Cambridge MA: Harvard University Press.

Nussbaum, M.C. (2012), *The New Religious Intolerance*. Cambridge MA: Harvard University Press.

Prandecki, K. (2012), Rola megatrendów w przewidywaniu przyszłości [The role of megatrends in predicting the future]. *Przyszłość Świat-Europa-Polska*, 2(26)/2012, 75–94.

Prandecki, K. (2014), Will authoritarian developmentalism dominate the world? *Przyszłość Świat-Europa-Polska*, 2/2014, 35–54.

Prandecki, K. (2018), Ochrona środowiska naturalnego w dobie przesileń cywilizacyjnych [Protection of the Natural Environment in the Age of Civilizational Transitions]. Komitet Prognoz "Polska 2000 Plus" PAN, Warszawa.

Prandecki, K., Nawrot, K. A., & Wawrzyński, M. (2013), Nowe centrum i nowe peryferia połowy XXI wieku [The New Center and New Peripheries of the mid-21st Century]. *Przyszłość Świat-Europa-Polska*, 28(2), 58–81.

Prandecki, K., Nawrot, K. A., Fronia, M., & Wawrzyński, M. (2013), Megatrends and Sustainable Development. *Problemy Ekorozwoju/Problems of Sustainable Development*, 8(2), 49–61.

Rybiński, K. (2007), *Globalizacja w trzech odsłonach* [Globalization in Three Acts]. Difin, Warszawa.

Sorokin, P. (1927), Social Mobility. New York: Harper.

Sowell, F. (2016), *Wealth, Poverty and Politics*. Basic Books.

Standing , G. (2011), *The Precariat: The New Dangerous Class*. A&C Black.

Stern, S. (2009), *The Global Deal: Climate Change and the Creation of a New Era of Progress and Prosperity,* Public Affairs

Stiglitz, G. (2012), The Price of Inequality: How Today's Divided Society Endangers Our Future. W. W. Norton & Company.

UNDP (2019), *World Population Prospects 2019.* (custom data acquired via website). United Nations, Department of Economic and Social Affairs.

Vaidya, A. (ed). (2006), *Globalization: Encyclopedia of Trade, Labor and Politics*. Vol. I and II. (2006), Santa Barbara, Toronto.

von Weizacker, E.U. Walkman, A. (2018), Capitalism, Short-termism, Population and the Destruction of the Planet. Springer-Verlag New York

Wallach-Wells, D. (2019), The Uninhabitable Earth: Life After Warming. Tim Guddan Books.

Wierzbicki, A.P. (2015), *Przyszłość pracy w społeczeństwie informacyjnym* [The Future of Labor in Information Society]. Wydawnictwo Komitet Prognoz "Polska 2000 Plus". PAN, Warszawa.

Wilkin, J. *Instytucjonalne i kulturowe podstawy gospodarowania: Humanistyczna perspektywa ekonomii* [Institutional and Cultural Foundations of Management: The Humanist Perspective on Economics]. Wydawnictwo Scholar, Warszawa.

Zacher, L. (2015), Rewolucja informacyjna a dystrybucja wiedzy i władzy. in: Rewolucja informacyjna a kryzys intelektualny. Komitet Prognoz "Polska 2000 Plus" PAN, Warszawa.

Zorska, A. (2016), *Ku globalizacji: Przemiany w korporacjach ponadnarodowych* [Towards Globalization: Transformations in Transnational Corporations]. Wydawnictwo PWE.

Paweł Kozłowski[1]

THE REVERBERATIONS OF GLOBALIZATION

Abstract

This chapter examines globalization from a three-component, narrowing perspective: as an ideology, as a political project derived therefrom, and as real reactions triggered in response to both of these aspects. None of the conditions of globalization has been met to a sufficient extent, and none of its real forms are consistent with the declared goals and assumed effects. Globalization, treated as an ideology that reveals an end to history, shows the path leading to it, and constitutes the crowning achievement of the development of mankind, is shown to have its roots in the same way of thinking as Marxist scientific communism. We conclude that the ideology of globalization and the unsatisfactory attempts to put it into effect as one of various political projects have been replaced by responsive reactions. It is these reactions that are now shaping the emerging world of the near future.

Keywords: globalization, reactions to globalization

1. Introduction

The closing decades of the 20th century witnessed the overlapping of three major processes: globalization, the rise of neoliberalism, and economic transition to capitalism. Each of these could have occurred independently (though this is true to the greatest extent for the second process), but their cooccurrence meant that each of them informed and was informed by the remaining two. Here, it is difficult to separate the effects from the causes, let alone to tease apart positive correlations. Such is often the case for real social processes, unlike for the rules of logic that apply in the work of the analytical mind. These processes were broad in scope, embracing the political, social, cultural, and economic spheres. Above all, however, they played out in people's awareness, because what they had in common was a shared ideological form. I consider this to be their primary form.

Each of those processes would have looked quite different had it not been intertwined with the remaining two by many threads. And had it not been for their cooccurrence, their material interdependencies would not have had to hold. Globalization itself could have been based on politics, universal laws, especially human rights, and a commonly adopted axiology. Neoliberalism could have been

[1] University of Warsaw

narrower in scope, applied in a particular country or small group of countries, providing them with tools for overcoming stagflation, much like an adhesive bandage applied temporarily to a break in the skin. Liberal ideology would have returned to the main direction of its evolution, set forth back in the 20th century by the intellectual contributions of such thinkers as John Stuart Mill, John Maynard Keynes, Isaiah Berlin, and John Rawls.[2] Economic transition could have looked different and could have taken directions different from those followed by European countries. It could have resulted from choices, actual choices, as opposed to solutions imposed by others and adapted to the needs of specific societies, and from an open collection of market-economy models, and followed in politics the path that was laid forth in the golden age of capitalism and liberal democracy, retaining in the social sphere the convergence of different institutions as well as protecting the autotelic and overriding nature of culture.[3] China is an example of yet another path; following it requires a change of system and maintaining the continuity of political institutions.

The combination of these three historical events created what Hegel would describe as a "moment" in the process of history, the situation of a transient, special condensation of the flow of social time that involves a clash of different trends.[4] This combination once determined the shape of the world and the emerging future; now, a new, responsive "moment" is determining the modern era and shaping the next period.

2. Globalization as an ideology

Globalization is a polysemous, conceptually heterogenous word. It is often conceived of as a process or a state of affairs characteristic of the last two decades of the 20th century and the early 21st, expected to stretch into many years and centuries to come. Such temporal boundaries and the related periodization are nonetheless based on a certain simplification.[5] Previously, too, the free-market and political system was characterized by a similar, global expansion. Consequently, globalization has long been observed and analyzed, though it was named

[2] *Cf.* for example A. Walicki, *Od projektu komunistycznego do neoliberalnej utopii*, Kraków 2013, pp. 335–424 and C. Crouch, *The Strange Non-death of Neoliberalism*, Polity, 2011.

[3] Tadeusz Kowalik warned repeatedly and already during preparations for Poland's transition that we should at least not try to be "the top students in class." On importance of culture, *cf.* for example M. Fisher, *Capitalist Realism: Is There no Alternative?*, 2020, Zero Books, and N. Srnicek and A. Williams, *Inventing the Future*, Verso, 2019.

[4] *Cf.* Ch. Mouffe, *For a Left Populism*, Verso, 2018.

[5] G. Ziewiec, *Trzy fale globalizacji: Rozwój, nadzieje i rozczarowania – 1870–1913, 1950–1973, 1980–?*, Warsaw 2012. See also for example R. Luxemburg, *The Accumulation of Capital: A Contribution to an Economic Explanation of Imperialism*, the original edition of 1913, R. Hilferding, *Finance Capital*, the original edition of 1910, and the writings of N. Bukharin and V. I. Lenin from the same period.

differently – and not without reason, because it really did occur and could be regarded as a permanent factor behind capitalist development, albeit also one whose activity varied in time.

However, the globalization of the late 20th century differs from its previous forms, or "waves" as Gabriela Ziewiec calls them. It has turned into an ideology and, when seen from a somewhat different perspective, a certain utopia. This is how it is viewed by its followers and practitioners, who as a rule depict it as a necessary, natural, and scientifically confirmed stage in historical development. It has come to exemplify the laws of history.

Globalization as an ideology was presented perhaps in the broadest way by Francis Fukuyama.[6] It is worth citing his essay, not because it was especially insightful or pioneering, but rather for opposite reasons: it had a considerable amount of influence over the world precisely because it largely voiced the day-to-day understanding of politicians and leading commentators and the casual knowledge of the public at large. Fukuyama, a professor at American universities and expert think-tank analyst, may be regarded as a leading ideologue of present-day globalization. It is in this role and from this angle that we define the most important ideological elements of Fukuyama's essay.

Globalization, which reached its culmination in the closing years of the 20th century and was presented as a dominant ideology, was interpreted as ushering in the end of history, understood as the clashing of major social ideas. The process of history, in line with Hegel's work, had just come to an end. A period of ideological stagnation and political stability had begun. Some call this a state of boredome, while others see it as cozily peaceful – history no longer guides human actions or determines their effects, because it has reached its apogee and ceased to exist. Globalization as the final stage of the process of development has three roots that must be considered together, otherwise it will be reduced to ruins as an ideology and as a practice, with chaos and regression then ensuing.

The first pillar consists of the market economy. It is an economic system centered around market self-regulation, which leads to harmony and forms the basis of rational behavior, while remaining subject to the same rules as the natural world and therefore intellectually cognizable according to the naturalist model. Studies of the market economy are scientific in their nature, with classical economics providing tools and its modern continuators formulating scientific hypotheses on par with those posited by biologists and physicists.

Upholding the second pillar is the liberal democratic system and the policies that follow from it. This is where "the liberty of the ancients" meets "the liberty of the moderns," and a strong, complementary relationship should exist in each of them.[7]

---

6 F. Fukuyama, "The End of History?", an article originally published in *The National Interest*, No. 16, 1989.

7 B. Constant, "The Liberty of the Ancients Compared With That of the Moderns," in Democracy: A Reader, eds. R. Blaug and J. Schwartzmantel, Columbia University Press, 2017, pp. 108-110, https://doi.org/10.7312/blau17412-021

In globalization, however, "the liberty of the moderns" has taken on special significance, namely that of "a 'neoliberal' ideology, or unilaterally economic liberalism (...), the identification of liberal freedom with economic freedom, and the latter with the freedom of the market. This apologia of market freedom is very often linked to the argument of the absence of development alternatives."[8] Democracy, or everyone's right to cast his or her vote when electing political officials, and the equal weight of such votes (in keeping with the "one person, one vote" principle), are basic components in the foundations of the legitimization of the system of government and the right to govern. However, these foundations are now often different from how the system actually functions, which is expressed in the motto of today's Spanish Indignados Movement: "we have a vote, but we do not have a voice." Consequently, the ideology becomes a utopia, the ideal is not drawing nearer to empirical facts, but at best we are offered assurances that we are just one step away from its complete fulfillment.

The third pillar is formed by the scope of globalization – it must be all-pervasive, and indeed it almost is; soon, it will be entirely so. Liberal democracy will reign everywhere, and the free market will cover the whole of the planet. Presented at the beginning of the 19th century, David Ricardo's theory of comparative advantage is becoming increasingly powerful.[9] Globalization may now fully come to fruition thanks to electronics, the network of financial institutions, the expansion of corporations, and growing communication connections.

Globalization unites all societies, and it will secure stable peace, because such are the salubrious effects of the free market. Such assurances were made centuries ago by our ancestors, and such arguments were voiced recently by Friedrich Hayek. The foundations of globalization being created are especially strong, because the new structure of the world will in fact eliminate the division into national economies and their borders and invalidate their distinctiveness. Trade will be pursued within a single economy, not between different specialized economies. By the same token, the theory of comparative advantage will be first utilized consistently, and then overcome.

In the period in which it held sway over the minds of intellectuals (especially economists), the ideology of globalization had similar properties as the ideology that preceded it, namely that of Marxist communism, whose influence had reached its peak in the late 19th century and in the first half of the 20th. Followers of both ideologies could say: it is clear what direction the world is heading in, and we must follow suit or perish.[10] Researchers of globalization, assuming the role of prophetic ideologues, announced in the spirit of the naturalist

[8] A. Walicki, *Od projektu… op. cit.*, p. 326.

[9] D. Ricardo, *Principles of Political Economy and Taxation*, 1817, and his continuers: E. Heckscher, B. Ohlin, and P. Samuelson, authors of the most famous economics textbook in the 20th century.

[10] M. Oakeshott, *Politics of Faith and Politics of Scepticsm*, Yale, 1996.

historical materialism of their ancestors, "In the future, we will experience, more than once, a major slowdowns in globalization but nothing will ever stop the process. […] Globalization [is] beneficial to mankind in total and on balance."[11] This "untamed power" is discovered thanks to the analysis of history and the economy, and its disclosure is a product of science, whose authority was likewise invoked 150 years earlier, when scientism established its control in the Western culture. Karl Popper identified the consequences of that fact, and Andrzej Walicki presented them synthetically in the following way: "those who have the only correct knowledge about the meaning and direction of history have not only the right but also the duty to disregard the will of the ignorant majority. (...) They may admit a mistake on one detail or another, but nonetheless draw on 'scientific socialism' to get the unwavering certainty that the course of events cannot be reversed, that History is on their side."[12] We could replace the term "scientific socialism" here with "globalization," and the sentence would retain the same significance and acquire a fresh topicality. This is because the structure of the thought remains unchanged, though it has been adjusted to modern-day circumstances and become more nuanced. It not only explains but also makes predictions and plays the role of political programming. For example, this is why "(...) the Bush administration (...) assumed regime change in Iraq [as a result of an armed invasion launched by the United States and its allies, including Poland – PK] would promote American interests while curbing terrorism and furthering democracy in the region (…), [and] a 'new Middle East' is on the horizon that will accept the United States as a model of government (...)."[13]

The ideology of globalization determines not only the direction of history, but also the order of the historical process. In the times of the aforementioned classical German philosopher, the leading role in the world was played by Prussia, as the embodiment of "historical reason." Similarly, imitators from the end of the 20th century argue that there is now a country that is the leader of global trends. This country is the United States, led in the years of the initiation of the new globalization ideology by President Ronald Reagan and shaped by the relevant principles, as adjusted to this role. The economism of vulgar Marxism was replaced by neoclassical economics, and the rejection of political pluralism entailed laying down universal, scientific procedures of management. The United States is showing the path to others, and if a county does not want to get lost or left behind, it should be as close to this global hegemon as possible. It is no coincidence that the liberal British philosopher John Gray could write repeatedly what Tadeusz Kowalik summed up succinctly: "Globalization is tantamount to

---

[11] G. W. Kołodko, *Whither the World: The Political Economy of the Future*, 2014, p. 125. The author presents a more detailed picture of globalization and introduces contrasts between light and dark, while retaining the basis for his main hypothesis.

[12] A. Walicki, *Marksizm i skok do królestwa wolności: Dzieje komunistycznej utopii*, Warsaw 1996, p. 198. *Cf.* also K. R. Popper, *The Open Society and its Enemies*, 1945, Routledge.

[13] J. Gray, Black Mass: Apocalyptic Religion and the Death of Utopia, Penguin UK, 2011.

striving for the Americanization of the modern-day world."[14] Applying this way of thinking and identifying the signs of history, we could conclude that globalization in its conquest is merely speeding up a course of events which would be headed in the same direction anyway. Iraq or other Arab countries, after overthrowing their ossified and reactionary institutions of power, will become free-market-oriented, liberal and democratic, and open to the world. This will happen naturally, in line with socio-historical laws that lead everyone to globalization, and a "push from the outside" will only act as a catalyst. Ideology always, and also in this case, invokes generalized arguments to justify oppression and war. It easily conceals the richness of reality behind simplifications – countries that have been conquered or fallen into disintegration have not yet become part of the stable order of globalization. The fall of countries, civil wars, and chaos have reminded us of the experiences of social history and the achievements of intellectual history: no system of government is natural, nor does it develop all of its own under what are called objective laws.

Over time, and quite clearly under President Donald Trump, the United States has ceased to promote globalization understood in this way and started to take national interests as its point of reference; the ideology of globalization, reduced to its economic aspects, has been taken over by China. This change in the global arena does not invalidate Gray's analyses or Kowalik's opinion, but rather indirectly confirms them.

The ideology of globalization should also apply to other countries; after all, it was said to follow from an unquestionable megatrend of history. It was recommended in Russia, where President Boris Yeltsin along with his political and economic camp and foreign advisers tried very hard to implement it. Let us reiterate that "at the end of the 20th century, Poland, having yielded to the persuasion of others and feeling superior over the 'sluggish West,' welcomed with enthusiasm neoliberal turbocapitalism and globalization. We also wanted to be first and to catch up on lost time, and when US Secretary of Defense Donald Rumsfeld talked about an emerging two-speed Europe, he portrayed us as a leader and as an example, using us to shame others and persuade them into imitation."[15] We, as top-of-the-class students in the American school, tried to leave behind the old European West. All the various assurances about the emergence of a new and sometimes even great world were never clearly taken back by anyone. Yet meanwhile, we can now see that the ideology of globalization is fizzling out, and after several decades of supremacy, it must fight for its hegemony from defensive positions.

[14] T. Kowalik, *Systemy gospodarcze: Efekty i defekty reform i zmian ustrojowych*, Warsaw 2005, p. 376. *Cf.* also J. Gray, *False Dawn*, first English edition 1998.

[15] P. Kozłowski, *Przeciw systemowi: Rozmowy z książkami*, Warsaw 2020, p. 220.

3. Globalization as a political project

Globalization required relevant institutions of a universal reach. After all, it was expected to entail not only broad trade, the movement of people, and the opening up of all economies, but also something much greater: a new global system whose "equilibrium brings benefits to broad swaths of the population."[16] This was a political project that involved creating a new world, an order of a universal reach that was separate from the order that emerged as a result of World War II. It is true no single, durable construct of this sort was settled upon; indeed there were five solutions formulated either explicitly or implicitly way in the globalization project. However, their realism was inversely proportional to their global usefulness, or usefulness for all humanity. Three of the solutions listed below assume the activity of governments and the consent of citizens to the adoption of a perspective in which it is acknowledged that "[o]nly a framework of global regulation – of currencies, capital movements, trade and environmental conservation – can enable the creativity of the world economy to be harnessed in the service of human needs."[17] The system of global regulation assumes the existence of effective governance and political solutions that take precedence over the global market. It may assume several forms and be organized in various ways. The first scenario would involve establishing a global government supported by all humanity, as opposed to one or several selected societies and guided by a global rationality embracing the human species.[18] Ideas of a new order on Earth are nothing new and express the dream of a great many thinkers, with both Immanuel Kant and August Cieszkowski among them. What the enlightenment-age German philosopher saw as the overriding value was perpetual peace, which means the exclusion of a state of peace "made with the secret reservation of material for a future war."[19] The Polish Romantic philosopher also prophesied the end of wars and the inauguration of an era of "perpetual peace." This was to be attained because "the reborn humanity will organize itself – a central Government of Humanity will be formed, and so will a Universal Tribunal of Nations and an Ecumenical Council of Humanity."[20] Kant called for a rational treaty to be reached between the world's countries, whereas Cieszkowski expected a Government of Humanity to emerge as a result of historical development. Such thinking is now

---

16 B. Guillochon, *La mondialisation: une seule planete, des projets divergents*, Larousse, 2009, p. 7.

17 J. Gray, *False Dawn: The Delusions of Global Capitalism*, Granta Books 2002, p. 199

18 *Cf.* J. Pajestka, *Prolegomena globalnej racjonalności człowieka*, Warsaw 1983. Janusz Stacewicz, elaborates on this idea by stating that "the sum of partial rationalities does not guarantee overall, global rationality", in J. Stacewicz, *Ekonomia na rozdrożu*, Warsaw 1991, p. 49.

19 I. Kant, *Perpetual Peace: A Philosophical Essay*, trans. Mary Campbell Smith, third impression, 1917. Cited from: https://www.gutenberg.org/files/50922/50922-h/50922-h.htm

20 A. Walicki, "August Cieszkowski," in *Polska myśl filozoficzna i społeczna*, Vol. 1., ed. A. Walicki, Warsaw 1973, p. 421.

accompanied by new circumstances: the escalating climate catastrophe, which is global in its reach and poses existential threats. It is being preceded by convulsions involving efforts to search for an ark to ensure the survival of the chosen ones.

The idea of a global government and universal harmony, centuries old though it is, has never yet been put into effect, but it was closest to coming into fruition after great disasters and the resultant yearning for global peace. In any case, sketching out plans to establish a global government belongs to the utopic realm, not in the sense of infantile fantasies and pipedreams but because it extends beyond history as we know it. Scenario two is less maximalist, but its actual implementation has been far from the announced goals and ideological justifications. It assumes the existence of a hegemon that would wield global influence and, most importantly, be guided by a universal axiology, not by its own particularistic interests. Until recently, after the fall of the Soviet Union and the rejection of the bipolar post-Yalta order, this role in the global arena was played by the United States. It led humanity in voicing and pursuing (as justified ideologically by such authors as Fukuyama) the project of a general human civilization, worked towards its materialization, and often sped up the course of the attendant changes. Before that, guided by a similar historiosophy, "[t]he former Soviet Union embodied a rival Enlightenment Utopia, that of a universal civilization in which markets were replaced by central planning. (...) Even though a global free market cannot be reconciled with any kind of planned economy, what these Utopias have in common is more fundamental than their differences."[21] The United States' political dominance derived, at least in the sphere of declarations, from the optimistic Enlightenment-age ideas, which were rejected under Donald Trump's presidency. Their axiological foundations were replaced by calculations taking economic interests as the point of reference. China, the world's new and powerful hegemon, is likewise guided by economic gains, striving to maximize them, as well as by the cohesion of the state and the improved standards of living for the whole of society, not by variously construed, overriding and universal ideological values.

The mission of leading the world and overseeing the global order, pursued by one or two powers, appears to be losing its existing foundations as well as the related appeal. Globalization as a political project expressing the United States' dominance has turned into a paradox and perhaps into the actual twilight of the West. The preceding "conflict between Soviet communism and liberal democracy was not a clash between the West and the rest. It was a family quarrel among western ideologies."[22]

When compared to these two projects, the third solution is narrower in scope, and its potential consequences are weaker. It is more modest, even minimalistic, but therefore also the most pragmatic of all, though most probably insufficient. It comprises a model of governance based on international agreements, or as

[21] J. Gray, *From the Great Transformation of Global Capitalism*, London 1998, p. 3. Cited from: https://archive.nytimes.com/www.nytimes.com/books/first/g/gray-dawn.html

[22] John Gray, False Dawn: The Delusions of Global Capitalism, Granta Books, 1998, p. 102.

Stanisław Ossowski once put it, "a system of intergroup agreements."[23] In this text of his (originally published by the author in 1943 under a pseudonym), Ossowski stressed the importance of the groups that act as intermediaries in undermining the force of the monocentric order, one in which power is focused in a single center and decisions have the form of commands. The existence of such groups, their horizontally and vertically diversified system, their extended network, and all signs of the active presence of such bodies all increase the territory of democratic society. The need to regulate globalization determines the opposite perspective: the actual multitude of countries, institutions and problems reduces the chances for the emergence of a center of global power – and even invalidates it. But even if there is no single government for all humanity, and it does not appear that such a government will emerge any time soon, because it is unclear whether it could assume a form other than despotism, this does not mean that we should give up laying down any global rules of coexistence. In line with this thinking, let us not strive to achieve all goals, let us give up maximizing our efforts to build what should be, and let us instead oppose what is destructive, what is prone to generate conflict, and what is bad from one perspective or another. Let us reject radical utopias and replace them with moderate and goal-oriented pragmatism – let us move forward one step at a time and choose what Karl Popper described as "piecemeal engineering," which prevents us from succumbing to the temptation of putting into effect something, which is of course the best thing, at any price. "The politician who adopts this method may or may not have a blueprint of society before his mind, he may or may not hope that mankind will one day realize an ideal state (...). The piecemeal engineer will, accordingly, adopt the method of searching for and fighting against, the greatest and most urgent evils of society, rather than searching for, and fighting for, its greatest ultimate good."[24] International agreements on peace, warfare, migrations, trade, the persecution of crimes, armaments, the flow of capital, taxation, work conditions, climate, and health are necessary and are indeed sometimes made. However, skeptics have reservations: countries often do not observe the agreements they have signed, the enforcement measures are limited and many countries do not participate in them, and above all the deals do not cover crucial areas, are made with great difficulty and as a rule with considerable delay. The order of international agreements is far too minimalist in nature.[25]

The fourth solution involves the universal free market. It should form the order of the human world regardless of the will and intentions of its participants. "The social form of activity, and also the social form of products and the

---

23 S. Ossowski, "Ku nowym formom życia społecznego", in *Dzieła* Vol. 1, Warsaw 1968, p. 351.

24 K. Popper, *The Open Society and Its Enemies*, Princeton University Press, 2020, p. 148

25 One variant of governance based on international agreements is the concept presented in the first half of 2020 by Russian President Vladimir Putin, who refers to the historical Yalta Conference and proposes a deal that would be made now by the most important countries of the world and would form the political construct of globalization. See V. Putin, "The Real Lessons of the 75th Anniversary of World War II," *The National Interest,* June 2020.

involvement of individuals in their division, appears here not as their mutual relation, but as their subjugation to relations independent of them."[26] For Marx, the free market culminated in the capitalist phase of historical development, and its deceptive objectivity resulted from the expansion of alienation. Advocates of the free market saw it as having similar characteristics, but these characteristics were beneficial and truly extrinsic and therefore "objective." Whether consciously or inadvertently, they invoked the thinking of the 18th-century theologian William Paley, "who believed the market to be a secular Providence."[27] References to this were also made later in the statements of such activists as Richard Cobden and John Bright, leaders of the Anti-Corn Law League, who argued – literally, not metaphorically – that "Free Trade is the International Law of God."[28]

Friedrich Hayek, the 20th century supporter of the market and one of the ideological parents of globalization as its product, continues this line of thinking. As the Austrian-British economist argues, the market should harmonize various individual interests and transform them into drivers of all-pervasive development.[29] It has catalectic properties, it is inclusive, it applies to everyone, and it turns enemies into friends. It also constitutes the center of general human rationality, which overcomes individual, class, national, and state particularism. It accumulates the knowledge acquired for generations, which surpasses in its depth ongoing attempts and achievements. The market here fulfills functions similar to those of the heritage of the past in the thinking of classical conservatism. Hayek and other supporters of *laissez-faire* believe that the global market embodies and guarantees freedom, and it emerges spontaneously, so any limitations are artificial and invariably inauspicious. It has self-regulating properties that cannot be accomplished in any other way. It must therefore be non-political, and it leads to the eradication of politics and the conflicts it generates.

It is not difficult to notice that historical experiences as well as the modern era have dispelled these illusions, denying the existence of a market that is free, accessible to everyone, and equal, fosters development that brings peace, creative collaboration, and distributes all market goods in a fair way.

The fifth and the last of the solutions that have been posited and tested aims to replace ideological politics with detailed policies, with skillful management. Here, irrational politics in the strict sense is replaced with rational leadership. The

---

26 K. Marx, *A Contribution to the Critique of Political Economy*, 1859, trans. S.W. Ryazanskaya 1993, cited from: https://www.marxists.org/archive/marx/works/1859/critique-pol-economy/index.htm

27 A. Walicki, *Od projektu…*, *op. cit*., p. 344.

28 Quoted after J. Gray, *Black Mass: Apocalyptic Religion and the Death of Utopia*, Penguin UK, London 2011. Gray elaborates on this thought and concludes that "[t]he free market became a religion only when its basis in religion was denied" and it was proven scientifically that it is natural in its character. See also R. H. Nelson, *Economics as Religion. From Samuelson to Chicago and Beyond*, Pennsylvania State University Press, 2001.

29 F. Hayek, *The Road to Serfdom*, first edition of 1944. Also F. Hayek, *Constitution of Liberty*, 1960, and *Individualism and Economic Order*, 1948.

economy should be excluded from the domain of politics, and so should countries – here, democratic elections serve the purpose of choosing experts from among a group selected by other experts and presented to the public. All institutions focus on maximizing profits in a process regulated by bureaucracy, which allows everything to be expressed in quantitative or monetary terms. In this model, countries are similar to corporations in which a contract is concluded tacitly between the staff and the decisionmakers: we give you more and more material goods, while you trust us and subject yourselves to our authority. This is a modern version of Pascal's wager or, as has been noticed, the Faustian pact with the devil.[30] Such post-politics has as its companion post-democracy: the old civil agora assumes the form of a modern economic market, with public image replacing content and marketing taking the place of the exchange of thoughts and truth-based arguments. The main domains of the functioning of the social world are closed off and excluded from external control. The dominant role is played by instrumental rationality, taking market position and striving to increase profits as its reference points. The goals are given, and there is universal agreement on their primary value (shaped by culture and sociology), with experts in the achievement of such goals (managers) skillfully choosing measures best suited for their achievement. In academic institutions, special importance is attached to management (often combined with finance and marketing), which is today gaining the status of the most prestigious and lucrative science, just as theology did in the theocratic culture of the Middle Ages. This model turns the pluralism of humanity into a homogenous organization patterned on business corporations, showing everyone the path to a generally accepted goal: maximizing the value (and quantity) of material goods and amassing more status goods. Any tensions that may appear on this road are negotiable and can be resolved in a positive way, based on the same rationality. A global managerial-consumerist system is emerging that is a socially functional construct keeping the chaos of globalization under control. In this system, procedures and bureaucracy eliminate the amorphousness of democracy (leaving only its outward guise) and prevent the dangerous diversity of bottom-up rules.

None of these five models of the political project of globalization has been put into effect sufficiently or in a way that was consistent with the professed goals. Globalization did not take on the characteristics of an internally harmonized social system. On the contrary, it has intensified numerous conflicts as well as sparked off new ones as well as compounded crises in the fields of migration, climate, politics, health, resources, finances, and economics... It has become a manifestation of "the anarchic environment of the disorganized global capitalism."[31] Globalization ceased to be an ideological pledge, a utopian promise, and a political project. Rather, it became a challenge.

---

[30] *Cf.* J. Gray, in *The New Statesman*, April 2020 and the activity of the Club of Rome (established in 1968), especially the first report written for the institution, namely *The Limits of Growth* (first published in 1972).

[31] J. Gray, *False Dawn… op. cit*., p. 76.

4. Globalization as a source of responsiveness

Globalization causes reactions whose initial apparent randomness transforms into more or less crystallized forms; these responses are sometimes formulated by their participants in a conscious way and further elaborated, sometimes manifested spontaneously and thoughtlessly. All of them are aimed against globalization as an ideology and its illusory pledges. They are also signs of the non-fulfillment of globalization as a political project. If we return to Hegel, mentioned by Fukuyama, we see that globalization has provoked authentic mental and physical activity. Such activity was expected and as a rule not new, or in other words possible to predict and therefore "natural," if we consider the metaphorically understood norm occurring in socio-historical processes.

The first of the responses to globalization is the increased eagerness to defend, or even to intensify identity: both one's own, individual identity and collective identity. Globalization has crumbled all the forms of existing identities without offering any new ones; after all, it was expected to render the individual, along with its links to other people and to symbols, fully mobile in the social, economic, and spatial sense. The effects included the acutely felt loss of the safe sense of being oneself and in one's own place, and therefore growth in the value of identity and something that could be described as a yearning for identity. When self-definitions are identical with one's life experience, self-image is consistent with the necessity of fulfilling externally imposed requirements, and the names that have been used so far and internalized are linked to the vocabulary promoted by the leading institutions of the new world, namely corporations, media outlets, and educators – all these things stimulate efforts on the part of those who are harshly affected by the breakdown of cohesion and the loss of the sense of belonging. Shaking individual identities and causing them to disintegrate leads not only to confusion but also to social anomie. This is coupled with the intensification of anxieties, a growing need for security, and the treatment of the satisfaction of this need as the most important task in life. This socio-psychological process also results in political efforts to organize collective life in a way that makes security the primary goal. This is no coincidence, because the sense of a minimum level of existential certainty rises in importance and is therefore greater than the value of individual freedom, spontaneity, expression, the choice of one's life path, and personal development.

Collective identity, as linked to the individual belonging to it, grows in importance in situations of danger. In reaction to globalization, the pendulum swings away from *Gesellschaft* (society) towards *Gemeinschaft* (community), or away from a group brought together by interests, calculation, contracts, and the division of roles, towards spontaneity, emotions, full individualism, and mental warmth.[32]

[32] F. Tönnies, *Community and Society*, trans. Charles P. Loomis, Michigan State University Press, 1957

The significance of collective identity manifests itself in the return of nationalism (in the Anglophone, or descriptive, sense of the concept, as opposed to the judgmental and pejorative sense) on the social scene, with "'uprooted' individuals, just like after the breakup of feudalism, starting to find themselves within the imaginative community formed by the nation."[33] It is therefore no coincidence that we can observe – as a result of deliberations on modernity – the appearance of hypotheses about "the absolute centrality of nationalism in our experience" and its role as "the constitutive element of modernity."[34] In crisis situations, or a more intense sense of the loss of security, people return to the nation, which may be seen as the exemplification of the psychoanalytic theory of regression, but the thing is that despite the ideology of globalization they have never really left the nation. Nation-states have not disappeared, not only in the psychosocial realm but also in the realm of political action, just as the global processes have not blurred their borders. The 2020 pandemic crisis is a particularly powerful illustration of this, including in the context of the behavior of the EU member states. The nation, awareness, and national ties have not lost their function; they have turned out to be vital and irreplaceable. Struggling against the nation in the name of globalization or post-modernity or for other reasons proves counter-effective, and declaring its end is as justified as the belief that the global open market entails the end of warfare and the emergence of joint action taken by everyone. This is why the way in which we understand the word "nation" and choose to define it is especially important and carries political consequences. The response to fears about the loss of national identity does not have to boil down to the ethnic nation and to ethnonationalism, which glorifies it, but can also involve understanding the nation as a pluralistic community composed of smaller cultures, groups, and styles that communicate with one another and make it possible for people to choose their life paths, a community that is open to others and respects the autonomy of individuals. In other words, the nation – defined in keeping with liberal nationalism, which does not always give an unwavering sense of certainty, but does not engulf anyone in full – as Czesław Miłosz put it, does not "consume" anyone and "leaves room for free self-determination" for everyone. It ensures an "identity that can be consciously shaped and changed."[35]

Identity has many forms, not only ones that refer to individuals or nations. There are also vigorous group identities – religious, moral, sexual, ideological, local, cultural, and so on. Consequently, what emerged simultaneously was "identity politics," similar to "a prism refracting a single beam of light into its constituent colors, producing a rainbow."[36] Showcasing identities has divided

---

33 J. Szacki, *Historia myśli socjologicznej*, Warsaw 2002, p. 173.

34 L. Greenfeld, *Nationalism. Five Roads to Modernity*, Harvard University Press 1992.

35 A. Walicki, *Naród, nacjonalizm, patriotyzm,* Prace wybrane, Vol. 1, Kraków 2009, p. 407. See also A. Walicki, conversation with P. Kozłowski, "Polska–naród–Europa" in *Zdanie* no. 3–4, 1997.

36 M. Lilla, The Once and Future Liberal: After Identity Politics, New York 2017, p. 9

society into groups and made them closed, and the requirement of being oneself has supplanted politics treated as an irreplaceable type of human creativity. Concentration on the defense of one's own, individual or collective "self," prompts others to behave in a similar way, with the open democratic community transforming into a collection different communities that clash with one another. Intransigence and peculiar fundamentalism prevent any dialogue, not to mention consensus. The ability to give up part of one's identity was, for instance, a condition of the Polish Round Table deals that led to the end of communisim in the country. When identity-related pressure is intensified and identity politics is cultivated, on the other hand, maintaining deliberative democracy and social cohesion is difficult, if not impossible. There are many ways in which globalization affects it and the supranational European community, whose current "nationalism (…) is a reaction to problems, not the beginning of them."[37]

Emphasizing identities may be treated as a reaction to the globalization-related uprooting, to (what Zygmunt Bauman saw as) the fluidity of the post-modern world, uniformization, and alienation, which causes a sense of threat. Other responses to globalization as well as the question posed therein include the rebirth of populism and the attractiveness of authoritarianism.

Modern populism – born out of or at least strengthened by globalization – is a manifestation of the radicalism of democracy and the refusal to agree to "the pathology of representative politics."[38] Populism refers to direct democracy and is averse to existing institutions and political representation. This is because the main reason for its existence is the broad sense of strong disappointment caused by the existing leadership elites in society and the state, which resulted in wide disparities and the accumulation of wealth in the hands of few, the erosion of the "middle" of society and its material polarization, the negation and commercialization of the public sphere, and the governance of selected experts and managers incapacitating citizens and transforming them into "corporate human resources." Everyone was supposed to see improvement and live better lives in a wiser world led by the best, but that did not happen, and "contemporary representative democracy is tired, vindictive, paranoid, self-deceiving, clumsy and frequently ineffectual."[39] This is the democracy of viewers who are not satisfied with the show. The ratings of its directors and trust in the political elites and institutions are dwindling, and the disappearance of the sense of agency is not compensated by results of the governance of elites that are good for everyone. Consequently, populism does not treat them as guides or even mere allies but rejects them all in light of growing disappointment. It expects a fundamental change "from the bottom up," because

---

37 U. Guérot, *Der neue Bürgerkrieg: Das offene Europa und seine Feinde*, 2017, Propyläen Verlag.

38 P. Taggart, "Populism and the pathology of representative politics," in: eds. Y. Mény and Y. Surel, Democracies and the populist challenge. Palgrave Macmillan, Basingstoke, 2002, pp. 62–80.
Demokracja w obliczu populizmu, eds. Y. Mény, Y. Surel, Warsaw 2007, p. 33.

39 D. Runciman, How democracy ends, London 2018.

we have witnessed the arrival of "a populist moment," as Chantal Mouffe puts it, using Hegel's terminology.[40] Populism as a reaction to post-politics and post--democracy sets the world in motion, aiming to dismantle the tracks on which it has recently been driving, showing aversion to its current organization. We may be at a crossroads, and "(...) the 'populist moment' points to a 'return of the political' after years of post-politics. This return may open the way for authoritarian solutions – through regimes that weaken liberal-democratic institutions – but it can also lead to a reaffirmation and extension of democratic values."[41] It does not determine the methods or results of transformations, be they left- or right-wing ones. It merely expresses the old conviction voiced by the Polish revolutionary Jan Wacław Machajski, who argued that leaders managing the state's institutions are, in defiance of their public assertions, in practice guided by their own interests and striving to maximize their benefits, not by concern for a majority of society, and they do not feel obligated towards others, those whose positions are lower, to repay the debt that they owe them or even to practice a pragmatic engineering towards creating a homogenized, harmonious, and open society.[42]

Another reaction to the crisis of democracy in the times of globalization involves a shift towards authoritarianism. This means not the radicalization of democracy but its rejection, the withdrawal of citizens from co-participating and co-deciding, or from agency and political empowerment. Power is ceded to the few who control bureaucracy, institutions, laws/regulations, and the power of the state, and are expected to maintain order and stable security, exercise supervision, look after the development of the whole, and mete out justice. Authoritarianism is often linked to the old belief in the paternalistic duties of those in power and to ethnonationalism, in which citizens are transformed into the community of "our people." Autocracy imposes cohesion on the world, and the patriarch leading it expresses concerns about those he has under his care and offers them as a sense of security, which also embraces their future. At least that is what he professes, alleviating the tension and unrest that follow from the threat and risk inherent in a world that is unclear and dominated by few market players. At the same time, "the authoritarian measures that are everywhere in place could have been implemented within a political structure that remains, notionally, democratic."[43] This is favored by tensions and crises in such fields as nuclear weapons, migration, health, and climate. In this way, thanks to authoritarianism, people are given the impression that things are under control or at least a certain order is present, not thanks to their own actions but many people do nonetheless feel mental relief. Others replace them in this role and are sometimes listened to.[44]

---

40 See Ch. Mouffe, *For a Left…*, *op. cit.*, pp. 6–7

41 *Ibid.*, p. 14.

42 J. W. Machajski, *Pracownik umysłowy i inne pisma*, Warsaw 2016.

43 M. Fisher, *Capitalist… op. cit.*, p. 1.

44 J. Reykowski, *Rozczarowanie demokracją: Perspektywa psychologiczna*, Sopot 2019, p. 238 and elsewhere.

An authoritarian regime is a response to ever-closer threats on the part of other countries, corporations, domestic elites, societies (migrating newcomers), economies (resources and energy), as well as growing natural and climate-related threats. It may but does not have to draw closer to what Herbert Spencer described as a military society: characterized by discipline imposed from the top, centralization, and strict order.[45]

Populism is collective activism, an authoritarian regime is an individualized absence; the former expresses its readiness to take the matters in its own hands, whereas the latter entrusts the course of events to a caring father, preferably a charismatic one. Both solutions reject the existing system, because it has disappointed them.

A different, third response to globalization involves protectionism, which is starting to gain appeal in the economic sphere, but it is not termed so in a clear way. Similarly, the withdrawal from a liberal democracy is not defined openly, and in such cases a restricting adjective is added to this term to announce that what we are witnessing is the arrival of real democracy or at least something that is very close to it. Different manifestations of reemerging protectionism are defined elliptically, for example as relocation or "asymmetric trade policies."[46] Many characteristics of economic policy aimed at changing the economic system in a specific country and creating distance to neoliberal globalization refer to the foundations (albeit not to the historically and situationally conditioned details) of the arguments that were put forward in 1791 by Alexander Hamilton and referred to the protection of America's "infant industries."[47] The platform proposed by Hamilton, which was one of the three Federalists, included many instruments protecting the development of the country's economy against competition on the part of more powerful players. His recommendations, which for understandable reasons essentially pertained only to industry, were as follows: protective tariffs, import bans, subsidies, export bans on key resources, duty drawbacks on imported semi-processed goods for the industry, rewards for innovation, the standardization of production quality, the development of transportation infrastructure, and the network of financial institutions.[48] Today, we can add tax preferences and sanitary barriers on borders – aside from that, none of these measures have become outdated.

The United States on the threshold of its birth and England in the period of the emergence of industry and capitalism protected their economies, and also today "the countries that are economic powers are setting up barriers against the inflow of products from countries characterized by poor or medium development." Such

45 H. Spencer, *Principles of Sociology*, first edition: London 1876–1879.

46 J. D. Sachs, A. Warner, "Economic Reform and the Process of Global Integration," *Brookings Papers on Economic Activity*, 1995, Issue 1, p. 17.

47 This term, or essentially this theory, was then popularized by Friedrich List, who initially supported free trade but later concluded under the influence of Hamilton's ideas that free trade was only good for countries with similar levels of development.

48 A. Hamilton, "Writings," *The Library of America*, New York 2001, pp. 679–708.

restrictions apply in particular to the imports of food and textiles, or what these countries can offer to more advanced regions on competitive terms.[49] One particularly significant modern-day form of protectionism is the protection of a country's own R&D-focused intellectual property, which means various inventions and innovations that determine the success of a knowledge-based economy. Hence the program of implementing the concept of an "entrepreneurial state," formulated by Mariana Mazzucato, an economist respected in today's global arena. This agenda appeals to the ideas of Schumpeter and Keynes, and many governments have been attempting to put it into effect to a smaller or greater extent.[50]

Calls for reindustrialization, relocation, and greater independence, which have intensified since 2008 and also in connection with the 2020 coronavirus pandemic, require the state to act, rebuild its agency, and adopt its own strategy – in other words, to abandon the recently professed globalization ideology. Such an approach is justified, because, as the French economists argue, "[c]ontrary to the current description of semi-achieved globalization, we are currently living in an era of mere 'semi-globalization', since numerous indicators of world integration are surprisingly low. Only 2% of students are enrolled in foreign universities and 3% of the inhabitants of the planet live outside the country in which they were born. Only 7% of the directors of the S&P 500 companies, the companies quoted on the American stock exchange, are foreign. Finally, exports only represent 20% of world GDP."[51]

Protectionism, whether camouflaged or open, is alive and kicking and one can see reasons for its development. It is embracing individual countries or regional associations thereof. Its durability has sources similar to those of the expansion of identity politics, because "[t]he world is actually very open and could find itself undermined in the future by protest votes of people who felt themselves excluded, tempted by the prospect of isolationism through withdrawing behind their own borders."[52] Let us point out that the pandemic in 2020, which could be described as a globalization of viruses, has immediately caused the reestablishment of borders, also within the European Union, as well as across-the-board measures taken by governments in the territories subject to their legal authority. The need for security comes from numerous sources, it grows and becomes increasingly pertinent in different situations.

---

49 A. Sopoćko, "Globalizacja: Odwracające procesy," in *Przyszłość Polski w dobie globalizacji: Tezy*, Komitet Prognoz "Polska 2000 Plus" PAN i PTE, Warsaw 2020, pp. 16, 17.

50 See M. Mazzucato, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*, Anthem Press, 2013. The Polish edition, *Przedsiębiorcze państwo: Obalić mit o relacji sektora publicznego i prywatnego*, Poznań 2016, included an introduction written by Mateusz Morawiecki, who then served as deputy prime minister in charge of the economy (and at the time of writing is prime minister), identifying with the content of the book.

51 J.-H. Lorenzi, and M. Berrebi, *A Violent World: Modern Threats to Economic Stability*. New York: Palgrave Macmillan, 2016, p. 96

52 *Ibid.*, p. 97.

Another, or fourth clear reaction to globalization in this responsive catalogue involves the closing of space. Globalization, by definition and in practice, aimed at the full opening up of space, and the lifting of the Iron Curtain and the fall of the Berlin Wall were expected to hold significance that was not only real but also symbolic: freedom also means the freedom of movement and the freedom to choose where one resides. The ideals of the French Revolution and the demolition of the Parisian tollhouses were brought to completion, as it was hinted, by the lifting of all borders that shut off fragments of the common world all over the globe, especially in the West.[53] In reality, despite the ideology of opening, we can notice the return of borders in the form of walls, wires, barriers, devices detecting sound and heat, reflectors, and other measures, whether new or old. There are plenty of local reasons, and all of them boil down to the fact that outsiders, all those unwanted newcomers, pose a threat to the locals. These or other barriers indeed appear to be more abundant now than they were in the era before globalization. The borders between Mexico and the United States are "referred to by some as 'the Iron Curtain,'"[54] there is still a minefield between North Korea and South Korea, and many other countries are erecting new walls or modernizing the old ones on the most sensitive sections of their borders. This has been done by such countries as "India, Botswana, Costa Rica, Peru, Iran, the United Arab Emirates, Saudi Arabia, South Africa, Israel, Uzbekistan and Kyrgyzstan, Turkey, Bulgaria, Hungary, Spain, Lithuania, and Russia..."[55] Let us add the (obviously temporary) restoration of borders within the European Union in 2020, the reinstatement of border controls between the UK and the continent, and Switzerland's pledge to reestablish its borders with the EU countries.

A border is not only a place on a map, it is not reduced to its physical dimension, administrative sanctions, guards in uniforms, or pledges to use force. "The worst aspect of the wall is to turn so many people into its defenders and produce a mental attitude that sees a wall running through everything, imagines the world as being divided into an evil and inferior part, on the outside, and a good and superior part, on the inside. A keeper of the wall need not be in physical proximity to it; he can be far away and it is enough that he carry within himself its image and pledge allegiance to the logical principles that the wall dictates."[56] Hopes were pinned on virtual proximity, but it does not mean real closeness, or unity, much in the same way as telephone contacts, which have been present for a long time, do not reduce physical distance, whether for good or for bad.[57]

---

53 J. Baszkiewicz, *Nowy człowiek, nowy naród, nowy świat: Mitologia i rzeczywistość rewolucji francuskiej*, Warsaw 1993, p. 127.

54 M. Kula, *Trzeba oswoić własne miejsce: Wykłady z socjologii historycznej*, Warsaw 2018, p. 219.

55 *Ibid*., p. 219–220.

56 R. Kapuściński, *Travels with Herodotus*. Knopf Doubleday Publishing Group, 2009, p. 59. *Cf.* also Z. Bauman, *Globalization: The Human Consequences*, Columbia University Press, 1998.

57 Cf. for example A. Munk's movie *Eroica* based on J. Stawiński's screenplay, 1957, especially the scenes with Edward Dziewoński as the leading actor (portraying Dzidziuś).

The ideology of globalization and the unsatisfactory attempts to put it into effect as one of various political projects have been replaced by responsive reactions. They are shaping the world of the near future, which is now emerging. At the same time, they do not challenge the expansion of great corporations, the dominance of the financial sphere, or world trade. This picture must include the experiences of the pandemic crisis in 2020, which have been merely sketched out here, and particularly profound climate change, which is an ongoing process. Reactions to these critical transformations of the world's natural environment should be likewise global, but they would require axiological foundations shared by all humanity. In reality, they only trigger partial reactions, which are significantly less effective.

Bibliography

Baszkiewicz J., (1993), *Nowy człowiek, nowy naród, nowy świat. Mitologia i rzeczywistość rewolucji francuskiej*, Warszawa.
Bauman Z., (2000), *Globalizacja. I co z tego dla ludzi wynika*, Warszawa.
Coustant B., (2003), Wolność starożytnych z wolnością nowoczesną porównana, *Res Publica Nowa*, jesień 2003.
Crouch C., (2015), *Osobliwa nie-śmierć neoliberalizmu*, Toruń.
Demokracja w obliczu populizmu, (2007), red. Y. Meny, Y. Surel, Warszawa.
Eroica, (1957), film w reżyserii A. Munka, według scenariusza J. S. Stawińskiego.
Fischer M., (2020), *Realizm kapitalistyczny. Czy nie ma alternatywy?*, Warszawa.
Fisher M., (2020), *Realizm kapitalistyczny. Czy nie ma alternatywy?*, Warszawa.
Fukuyama F., (1989), Czy koniec historii?. *The National Interest*, 16/1989.
Gray J., (1998), *From the Great Transformation of Global Capitalism*, London.
Gray J., (2001), *Po liberalizmie. Eseje wybrane*, Warszawa.
Gray J., (2009), *Czarna msza. Apokaliptyczna religia i śmierć utopii*, Kraków.
Gray J., (2009), *Czarna msza. Apokaliptyczna religia i śmierć utopii*, Kraków.
Gray J., (2014), *Fałszywy świt*, Warszawa, pierwsze wyd. angielskie: 1998 r.
Gray J., (2014), *Fałszywy świt. Urojenia globalnego kapitalizmu*, Wrocław.
Greenfeld L., (1992), *Nationalism. Five Roads to Modernity*, Harvard Uniw. Press
Guerot U., (2018) *Europejska wojna domowa*, Warszawa.
Guillochon B., (2003), Globalizacja. Jeden świat – różne drogi rozwoju, *Mała Encyklopedia Larousse*, Francja, Polska.
Hamilton A., (2001), *Writings*, The Library of the America, New York.
Hayek F., (1944), *Droga do zniewolenia*", pierwsze wydanie 1944.
Hayek F., (2006), *Konstytucja wolności*, Warszawa.
Hayek F., (2018), *Indywidualizm i porządek ekonomiczny*, Warszawa.
Hilferding R., (wyd. oryg. 1910), *Kapitał finansowy*, Wiedeń.
Kant I., (1995), *Projekt wieczystego pokoju*, Warszawa.
Kapuściński R., (2004), *Podróże z Herodotem*, Kraków.
Kołodko G.W., (2013), *Dokąd zmierza świat*, Warszawa.

Kowalik T., (2005), *Systemy gospodarcze. Efekty i defekty reform i zmian ustrojowych*, Warszawa.
Kozłowski P., (2020), *Przeciw systemowi. Rozmowy z książkami*, Warszawa
Kula M., (2018), *Trzeba oswoić własne miejsce. Wykłady z socjologii historycznej*, Warszawa.
Lilla M., (2018), *Koniec liberalizmu jaki znamy*, Warszawa.
Lorenzi J.-H., Berrebi M., (2018), *Świat przemocy. Gospodarka światowa 2016–2030*, Warszawa.
Luksemburg R., (wyd. oryg. 1913), *Akumulacja kapitału. Przyczynek do ekonomicznego wyjaśnienia imperializmu*, Berlin.
Machajski J.W., (2016), *Pracownik umysłowy i inne pisma*, Warszawa.
Marx K., (1953), *Grundrisse, der Kritik der politischen Okonomie*, Berlin.
Mazzucato M., (2016), *Przedsiębiorcze państwo. Obalić mit o relacji sektora publicznego i prywatnego*, Poznań.
Mouffe Ch., (2020), *W obronie lewicowego populizmu*, Warszawa 2020.
Mouffe Ch., (2020), *W obronie lewicowego populizmu*, Warszawa.
Nelson R.H., (2001), *Economics as Religion. From Samuelson to Chocago and Beyond*, Pensylwania State University Press.
Oakeshott M., (2019), *Polityka wiary i polityka sceptycyzmu*, Warszawa.
Ossowski St., (1968), Ku nowym formom życia społecznego, w: *Dzieła*, t. 1, Warszawa.
Pajestka J., (1983), *Prolegomena globalnej racjonalności człowieka*, Warszawa.
Popper K., (1993), *Społeczeństwo otwarte i jego wrogowie*, t. 1, Warszawa.
Popper K.R., (1993), *Społeczeństwo otwarte i jego wrogowie*, Warszawa.
Putin V., (2020), Real Lessons of the 75th Anniversary of War II, *National Interest,* June 2020.
Reykowski J., (2019), *Rozczarowanie demokracją. Perspektywa psychologiczna*, Sopot.
Ricardo D., (1957), *Zasady ekonomii politycznej i opodatkowania*, Warszawa.
Runciman D., (2019), *Jak kończy się demokracja*, Warszawa.
Sachs J., Warner A., (1995), Economic Reform and the Process of Global Integration, *Brookings Papers on Economic Activity*, 1995.
Sopoćko A., (2020), Globalizacja. Odwracające procesy, w: *Przyszłość Polski w dobie globalizacji. Tezy*, Komitet Prognoz „Polska 2000 Plus" PAN i PTE, Warszawa.
Spencer H., (1879), *Zasady socjologii*, wiele wydań, pierwsze: London 1876–1879.
Srnicek N., Williams A., *Wymyślając przyszłość*, Toruń.
Stacewicz J., (1991), *Ekonomia na rozdrożu*, Warszawa.
Szacki J., (2002), *Historia myśli socjologicznej*, Warszawa.
Tonnies F., (1988), *Wspónota i stowarzyszenie. Rozprawa o komunizmie i socjalizmie jako empirycznych formach kultury*, Warszawa.
Walicki A., (1973), August Cieszkowski, w: *Polska myśl filozoficzna i społeczna*, t. 1., red. A. Walicki, Warszawa.
Walicki A., (1996), *Marksizm i skok do królestwa wolności. Dzieje komunistycznej utopii*, Warszawa.
Walicki A., (1997), Polska–naród–Europa – rozmowa z P. Kozłowskim, w: *Zdanie* nr 3–4, 1997.
Walicki A., (2009), Naród, nacjonalizm, patriotyzm. *Pisma wybrane* t. 1, Kraków.
Walicki A., (2013), *Od projektu komunistycznego do neoliberalnej utopii*, Kraków.
Ziewiec G., (2012), *Trzy fale globalizacji. Rozwój, nadzieje i rozczarowania. 1870–1913, 1950–1973, 1980–?*, Warszawa.

Jan Grzegorek[1], *Andrzej P. Wierzbicki*[2]

WAVES OF INFORMATION REVOLUTION[3]

Abstract

The article discusses the wave-like nature of information revolution: the wave of television the wave of television the revolution, the first three waves of personal computers, mobile telephony and the Internet, and the upcoming three waves of widespread social use of robots, knowledge engineering (inaccurately called artificial intelligence and Internet of things), and biomedical engineering. The basic thesis of this article is that the changes carried by the upcoming three waves will be even larger and deeper than the changes carried by in the previous waves that we have experienced in the last thirty years. For example, the approximate forecast of the number of robots in the world suggests that this number in 2050 will exceed the number of the world's population.

Keywords: development forecasts; new techniques of information revolution and its social consequences

1. Introduction

Although the literature on the causes and the social effects of the socio--techno-economic processes of revolutionary importance, today called *information revolution,* is huge see. eg. (Brynjolfsson and McAfee, 2014 Levy and Murnane, 2012) but in general it does not pay attention to the fact that these processes consists of successive waves, some of which are only awaiting us. Analysis of such waves is the subject of this article.

The first of these waves, or rather zero, because it actually preceded and prepared the information revolution was a wave of social penetration of television. It is the best documented and based on its character, we can draw conclusions about the nature of next waves.

The information revolution actually began with the first wave of social penetration of personal computers, after which quickly followed next two waves: the second wave of social penetration of mobile telephony and the third wave of social internet penetration. In the following paragraphs we will discuss the inventions preceding these waves, the actual delay from the invention to the beginning

1 The Institute of Journalism, University of Warsaw, 00-310 Warszawa, Bednarska 2/4
2 National Institute of Telecommunication, Szachowa 1, 04-894 Warszawa
3 This article was originally published in the journal Przyszłość Świat-Europa-Polska, 3(35)/2016.

social penetration, and finally, the dynamics of these waves similar to each other, from which follows the possibility of predicting further course of such vawes.

The next waves are based on initial inventions made long ago, but the actual social penetration is delayed and we only expect an actual penetration of the fourth wave of mobile robots, of the fifth wave of knowledge engineering (commonly but inaccurately called artificial intelligence, Internet of things, etc.), And finally a wave of biomedical engineering . The actual social penetration of these waves, when the time comes, will probably have social effects comparable to or even greater than the social impact of the current three waves.

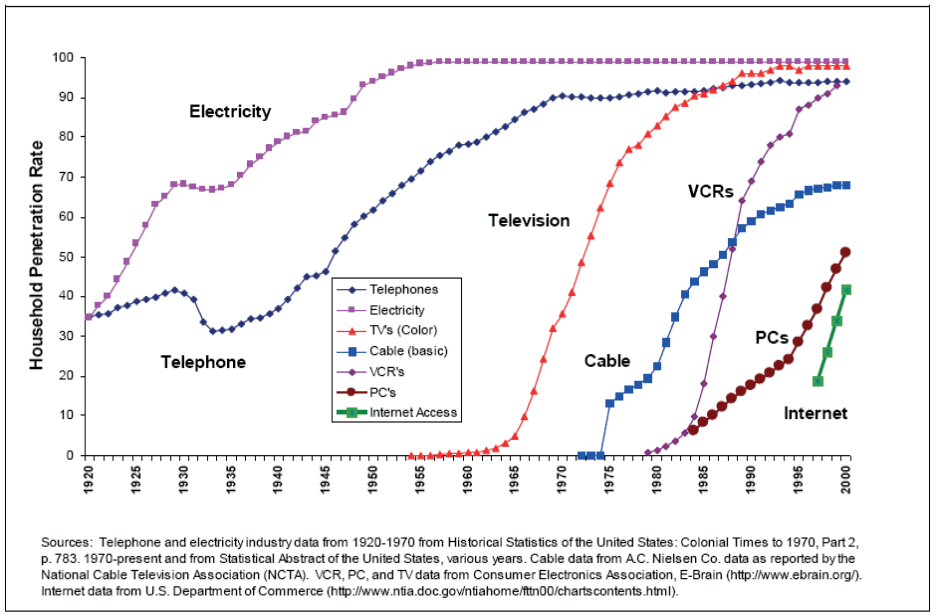
This is due to the fact that there is a specific relationship of positive feedback between the market and the high technology: the more the entrepreneur will gain through the use of high technology, the more he will be willing to invest in the further development and use of this or similar techniques. However, the processes of positive feedbacks lead to an avalanche-like development, constantly accelerating (until it hits the limit), which just today we observe. Therefore, changes of the way of life over the next thirty years will probably be even larger than those observed during the last thirty years. Thus it is especially important to analyze and provide a good understanding of the incoming waves. But to understand them we first need to analyze the waves which we have already experienced.

2. Characteristics of the wave of television

The first inventions, preparing TV (see. Wierzbicki 2011), date back to the year 1878 (Julian Ochorowicz in Poland, postulating the use of photocells for imaging) and 1880 (George Carey in the United States, similar concepts). Quite a long time, however, lasted until 1923 Vladimir Zworykin in the US developed a prototype electronic TV camera called Iconoscope, and in 1928 Kalman Tihanyi, also in the USA, has developed a prototype TV receiver. Since that time, again took a few years before in 1936, the BBC in London made the first televised broadcast media. While the beginning of the social penetration of television, namely the purchase of TV sets by a significant percentage of the population begins even in the US approx. 1950 and approx. 1960 in the case of color television.

The dynamics of the social process spread of color television in the United States compared to other, similar processes is illustrated in Fig. 1. While the previous processes of the social spread of electrification and telephone wire were slow and disrupted by crises and wars, the process of the social spread of color television was relatively fast and regular: a single percentage of the population to approx. 1965, then increase with the maximum speed of approx. 8% per annum, then gradual saturation, until in approx. 1995 the penetration of color television in the United States exceeded 95% of the population.

Fig. 1. The development of high-tech services and devices in the USA in the years 1920-2000.[3]



Social penetration of other products of high technology such as cable television, video recorder, the Internet had a similar, often initially slow, then greatly accelerated character. Characteristic for all of these processes is of large time delay from the original invention to the beginning of a massive social dissemination. For television the time (depending on the calculation method) reached possibly 80 years and at least 35 years. For other groundbreaking inventions such a time was slightly shorter, but also of about 40 years of age (as it will be illustrated by the analysis of next waves of information revolution). Various factors can cause that the delay time is shorter or longer. However, when public dissemination starts, the dynamic nature of these processes is mutually similar.

Therefore, for all these processes we can use similar mathematical models for statistical analysis and approximate prediction of their future development, see. (Grzegorek 2012), provided of course that we have statistical data about their current development.

Processes of social penetration can be predicted with the following mathematical models:

A logistic model is:

$$q(t) = a/(1 + b\ exp(-ct)); \quad (1)$$

[4] According to http://www.ntia.doc.gov/ntiahome/fttn00/chartscontents.html.

Gompertz model is:

$$q(t) = a \exp(-b \exp(-ct)); \quad (2)$$

Double-inertial model is:

$$q(t) = a\,(1 - \exp(-(t-T_0)/T_1)\,T_1/(T_1 - T_2) + \exp(-(t-T_0)/T_2)\,T_2/(T_1 - T_2))\,1(t-T_0) \quad (3)$$

where $q(t)$ is the estimated penetration of a technique in parts of the total population, and a, b, c, T_0, T_1, T_2 are parameters of these models which are determined by a statistical analysis of the previous course of penetration. The parameter T_0 indicates an observed start of penetration in the social model double-inertial; this model has the advantage over the other two which imply that the social penetration process starts at minus infinity. The parameter a denotes the saturation level of the penetration process measured in the parts of a whole, hence it can be theoretically set equal to one; but actual processes of penetration may omit part of the total population (children, etc.), or even exceed unity (if some of the users have, e.g. several mobile phones).

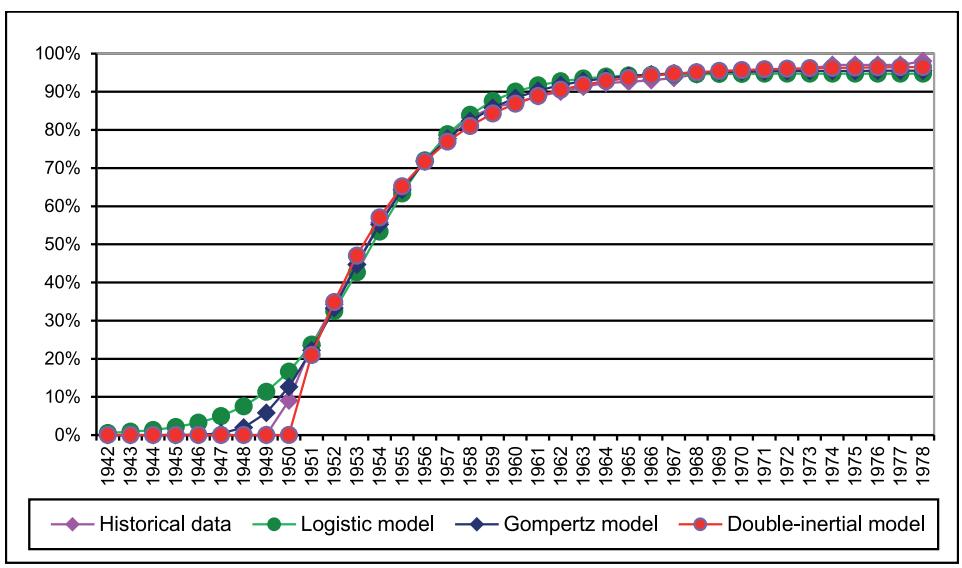
An example of the use of these models to the process of social penetration of color television in the United States is shown in Fig. 2.

The difference between these models is greatest in the initial phase of penetration and also for the largest projected increase rate. Statistical parameters matching these models were as follows:

For the logistic model: $a = 0.9474$, $b = 7.377$, $c = 0.4498$, which implies a maximum speed of rise $v_{maxl} = ac/4 = 10.66\%$/year.

For the Gompertz model $a = 0.9555$, $b = 2.805$, $c = 0.3261$, which implies a maximum speed of rise $v_{maxG} = ac/e = 11.5\%$/year

Fig. 2. Dissemination of color television in the United States, approximating curves



For the double-inertial model $a = 0.9663$, $T_1 = 4.2743$, $T_2 = 1.0570$, $T_0 = 1950$, which means that the maximum rate of change is $v_{maxd} = 16.2\%$/year, while the equation for its determination is rather complex:

$$vmaxd = \frac{a}{T_1 - T_2}\left[\exp\left(-\frac{T_2}{T_1 - T_2}\ln\left(\frac{T_1}{T_2}\right)\right) - \exp\left(-\frac{T_1}{T_1 - T_2}\ln\left(\frac{T_1}{T_2}\right)\right)\right] \quad (4)$$

The actually observed maximum speed of social penetration of television was (see Fig.1) about 15%/year, therefore the double-inertial model approximates best this speed, although it slightly overestimates the maximum social penetration (a).

While the social significance of television is obviously huge, it is not always positive; this was noted by Marshall McLuhan (1964) with his formulation that *media are massage* and Guy Debord (1967) with his concept of *spectacle society*. Today, the importance of television still increases because of its integration with mobile telephony and the Internet, which is discussed below.

3. Characteristics of the waves of personal computers, mobile telephony, Internet

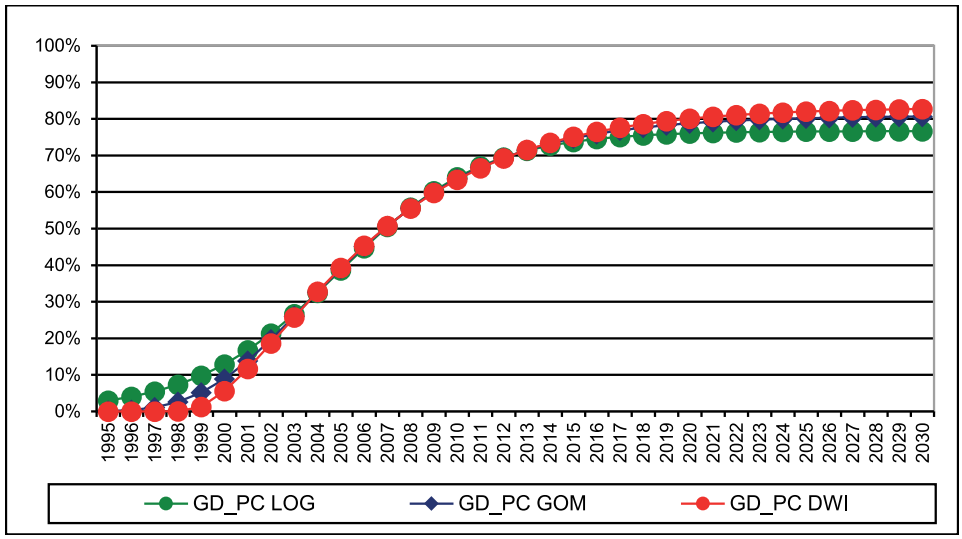
These waves began (in the sense of the beginnings of their social dissemination) quite a long time ago, today we observe only their progressive dissemination and integration of these waves, but with them also their growing social impact.

The wave of personal computers began not from the date of the inventions of electromechanical or electronic computers; these dates are 1931 (Vannevar Bush, analog computers based on telecom amplifiers with appropriate feedback loops) and 1936 (Konrad Zuse, digital computers initially based on the electromechanical elements of the telephone central relays, then gradually electronic vacuum tubes, and finally, transistors and integrated circuits). Due to the long-term improvement, a massive social penetration of computers began only in 1977, so with a delay of over 40 years, with the Apple II personal computer (Stephen Jobs and Stephen Wozniak). In approximately thirty years later, in 2008, the number of personal computers in the world has exceeded one billion (therefore more or less every eighth citizen of the world, including children and the elderly, used the computer) and grew further at a rate of about 150 million per year. Of course, the social penetration of computers in different countries differs greatly. E. g. if we apply similar models like to the wave of television, we obtain results for the social penetration of personal computers in Poland as shown in Fig. 3.

This figure shows that we can not expect 100% saturation of personal computers in Poland (whether due to the age of the users or their education), but predicted saturation levels are high (approx. 70-80%), although different for different models. Besides, this process can quickly change its character due to the expected progressive integration of personal computers with mobile telephony.

Inventions preceding the wave of mobile telephony can be interpreted diversely, because it was thought of and discussed since the beginnings of radio

Fig. 3. Social penetration of personal computers in Poland, approximating and forecasting curves (data until 2013, LOG denotes logistic model, GOM - Gompertz model, DWI - double inertial model)

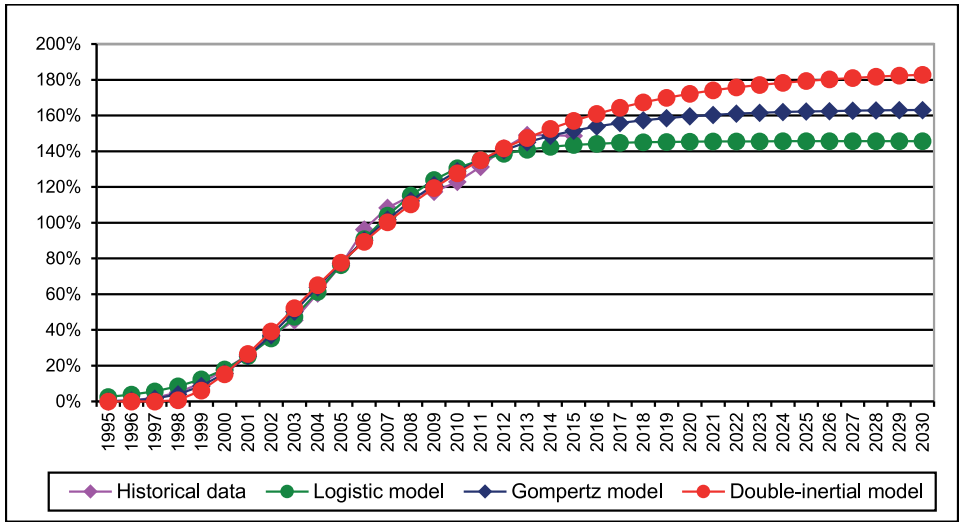


broadcasting, for example the invention of Guglielmo Marconi in 1895. However, the invention of a division of land into the (hexagonal) cells in which the corners are allocated antennas – which allows to cover the entire area for mobile telephony – occurred in 1943 for military purposes. Mobile telephony devices, however, were heavy, mainly due to the weight of the necessary batteries that powered these devices. Along with the use of transistors and integrated circuits, these devices have been progressively miniaturized, but the batteries remained heavy. Large corporations counted on dissemination of mobile phones; however, when in 1973 the heads of two corporations – AT & T Bell Laboratories and Motorola – demonstrated in a television broadcast cameras phones, they were kept barely in hand. Despite hopes connected with them, they did not achieve market success – because of both their still high weight (they were called brick-phones) and their excessive prices.

Only around 1990, the Finnish companies Radiolinja and Nokia, and after them quickly other corporations, marketed cheap versions of lightweight mobile phones, which led to their widespread social use. Counting from 1943 to the early spread of cheap and lightweight mobile phones, the delay of social use of mobile telephony amounted to approx. 50 years; the actual social dissemination was not saturated until today, hence the total delay is more than 70 years.

We see from Fig. 4 that we already account for more than one mobile telephony device for an average citizen of Poland, but forecasts of the saturation level of social penetration are diverse (from approx. 145% to 180%). This higher level is more likely, since the new mobile phone devices provide also Wi-Fi access.

Fig. 4. The spread of mobile telephony in Poland, approximating and forecasting curves (data until 2015).



The inventions preparing the Internet occurred also well in advance of the start of its social penetration. This was mainly the invention of hypertext, originally described in an article of Vannevar Bush *As We May Think* in 1945, then improved by several authors, until in 1992 Timothy Berners-Lee and his colleagues at CERN launched the first web server; which started a rapid spread of the Internet.

We see from Fig. 5 that over 60% of the Polish population has an access to the Internet, and the diversity of saturation levels in various projections (from 70% to 80%) again does not matter much, because of the integration of Internet access with mobile telephony which will change the saturation level.

4. Integration of waves and its social effects

At the moment, a far-reaching integration of all these four waves occurs: television, personal computers, mobile telephony and the Internet. New variants of mobile tablets and smartphones allow people to connect to the Internet, television, personal computer and mobile phone. These new versions of personal computers, smartphones and tablets are so cheap that some companies offering telecommunication services offer these versions for free as a part of their advertising services.

Larger smartphones, so-called phablets are adequate enough and their users do not need another in the form of a tablet. In addition, the tablets are not subsidized by the operators as smart phones that you can buy at a lower price (in fact,

Fig. 5. Internet penetration in Poland, approximating and predicting curves (data until 2014).

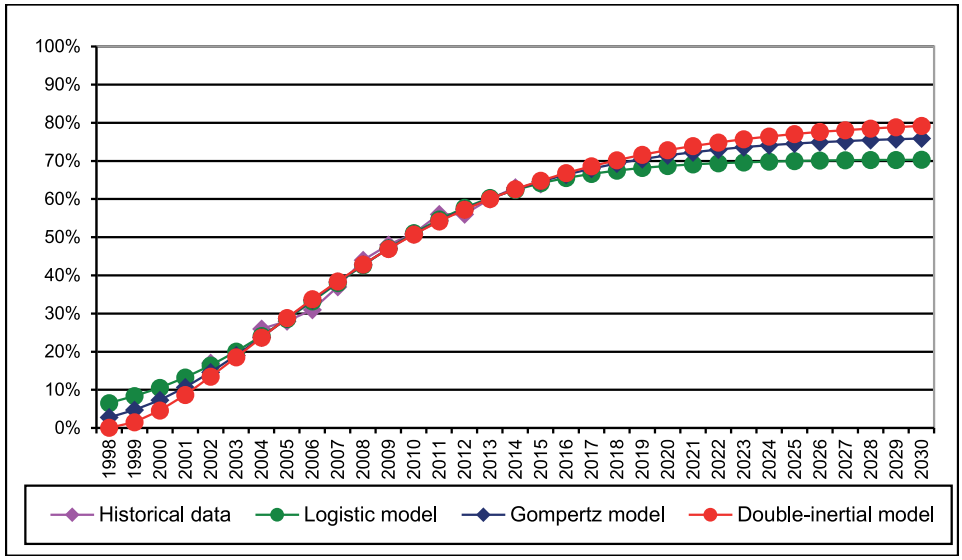
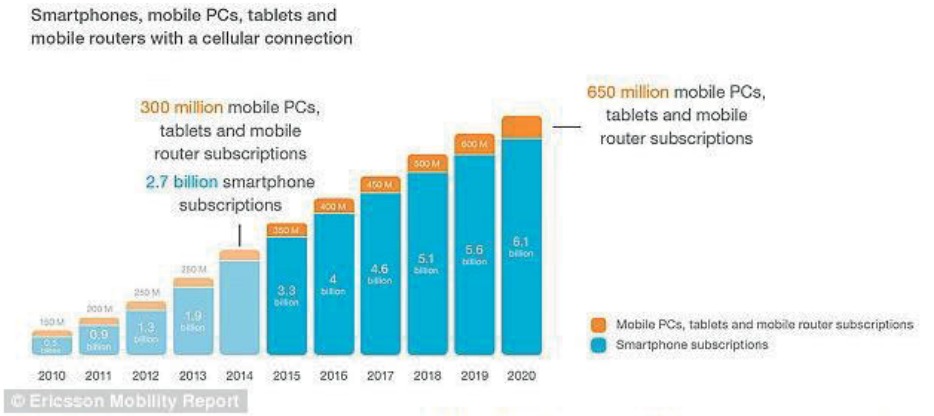


Fig. 6. The numbers of smartphones in the world [in millions] and their percentage share in mobile phones. According to eMarketer, December 2014

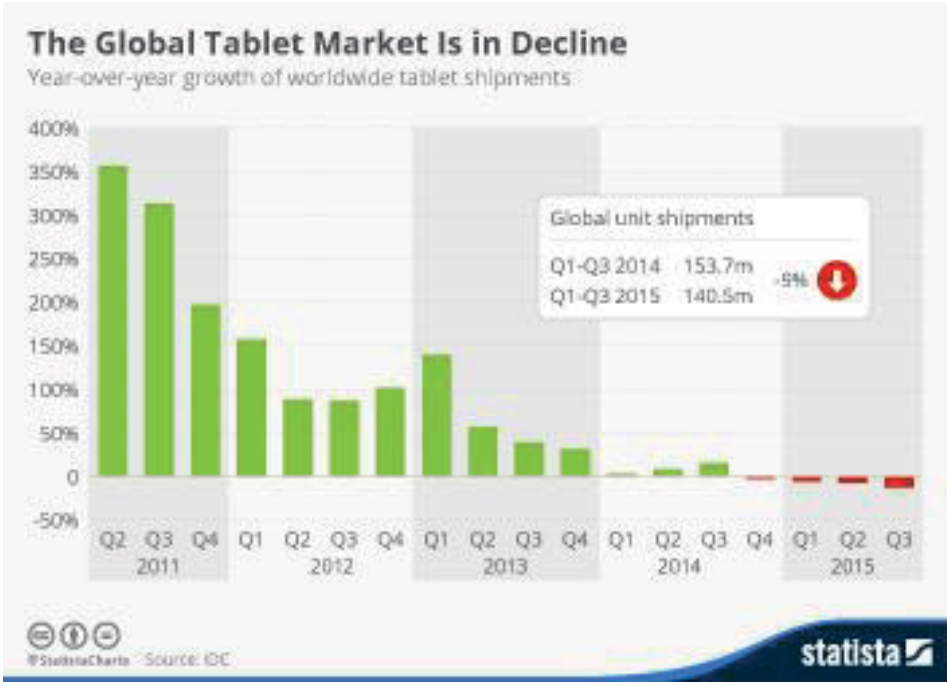


The predictions come from Ericsson's latest Mobility Report, which tracks trends around mobiles, data and networks worldwide. Within the next six years, the total number of people globally with smartphones could exceed 6.1 billion – up from this year's 2.7 billion (pictured)

the operators include their costs in the cost of a subscription). Therefore, the tablet market saturation is faster than in the case of smartphones, as illustrated in Fig. 7.

The integration of television, personal computers, mobile telephony and the Internet through smartphones and phablets has a huge social impact. On the one

Fig. 7. Saturation of the global tablet market



hand, it is possible to easily obtain information of various types such as, e.g., satellite positioning, identifying variants of road connections, access to Wikipedia and other web sources of information. On the other hand, the possibilities of mobile television enhance both its positive aspects and the negative: media massage (McLuhan 1964) is strengthened, the spectacle society (Debord, 1967) embraces a growing part of the global society. Naturally, advertisers emphasize only positive aspects of their advertised products, thus the growing impact of advertising must lead to a deepening of the information asymmetry in the market. This is seen by all the people, but what most of them do not realize is the fact that advertising multimedia is significantly more influential on the subconscious of people, than the verbal text; this turn stems from the fact that the immanent human perception, with all senses, processes several hundred greater volume of information than the verbal perception of a text.

It is true that thanks to this integration the public all over the world is better informed; but at the same time the dominance of advertising tells the poorest parts of societies, how the richest layer of the most developed countries lives and what it consumes. This causes, on the one hand, envy and an increase of terrorist moods, and on the other hand, migration pressure to Europe and the United States of the better educated part of the population of the poorest countries. This pressure will even increase under the influence of coming waves of information revolution.

5. Upcoming waves: robots, knowledge engineering, biomedical engineering

The first industrial robot was constructed in 1957, although the concept of a robot is much older. Since that time the gradual replacement began of the work of the industrial proletariat by working stationary robots. While you can argue that the substitution of labor by capital (or rather the tools and machines acquired by capital) progresses from the beginning of the industrial revolution of the late eighteenth century, and so far did not necessarily caused unemployment, only significant changes in the structure of work. But such a statement is self-deluding, for two reasons.

First, the substitution of labor by capital is a process with positive feedback: the more a capitalist gains on investments in new machinery and equipment, the more he is willing to invest in them further. Processes with positive feedback have the nature of an avalanche: they may start slowly, but then inevitably accelerate. Replacing work in enterprises by capital takes place today at an unprecedented pace and scale, see (Wierzbicki 2015), and hence historical opinions are not valid today.

Secondly, since around 1980 the developed countries used also another mechanism of globalization, exporting jobs to developing countries with lower labor costs which caused the destruction of industrial proletariat in their own countries. However, since robots as well as other information revolution devices are steadily becoming cheaper, therefore the above-mentioned mechanism of positive feedback will result in the destruction of industrial proletariat and the end of the work in enterprises also in poorer countries. This will increase the conflicts in these countries and further increase the above-mentioned migration pressure.

However, the prevalence of robots in industrial work is not yet accompanied by a widespread prevalence of robots in society. Such widespread dissemination will start when robots will walk with us on the streets (such as mobile phones do today), or will replace us in the service work, as, for example, in supermarkets already occurs in Japan. So it is not a permanent, only a transitory truth that the work in services replaces the industrial work; work the work in services is already shrinking not only because of the use of robots and computers, but also through the use of network services.

The number of robots in the world and the resulting projections illustrate Figs. 8, 9. They show that approximately around 2050, the number of robots will outnumber the world population. Even if it is only an approximate prediction, there is no doubt, however, that robots will walk with us on the streets and replace people in most of service work.

A similar, though less widely perceived character has a further wave of information revolution, namely the wave of knowledge engineering that is often popularly (though inaccurately) called the wave of artificial intelligence, ambient intelligence (or smart homes), the Internet of things, etc. It is related mainly to the knowledge mining in large data sets that grow in the world at a rate resulting from

Fig. 8. The number of robots in the world by the International Federation of Robotics (IFR)

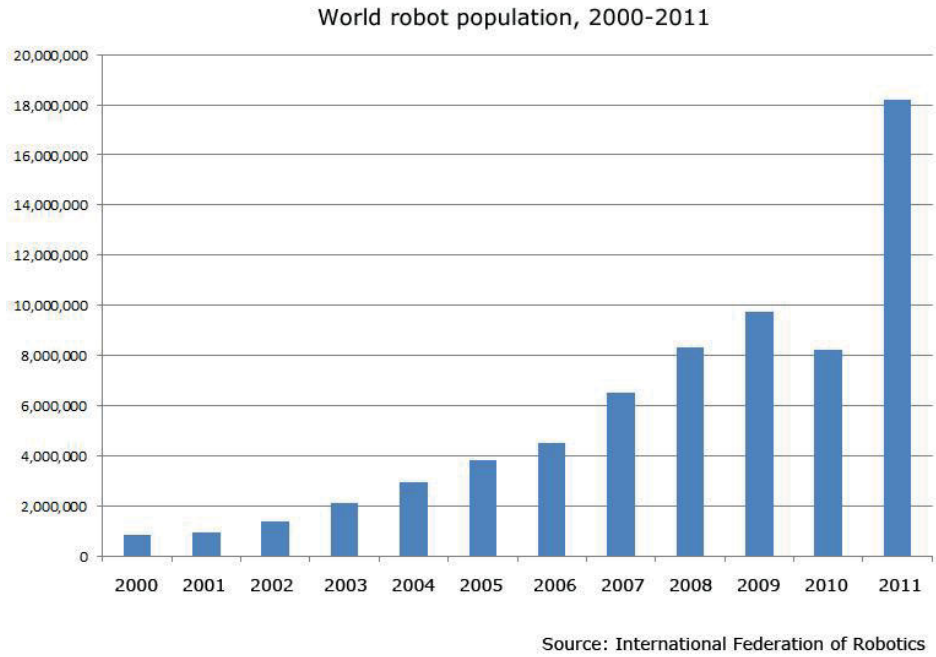
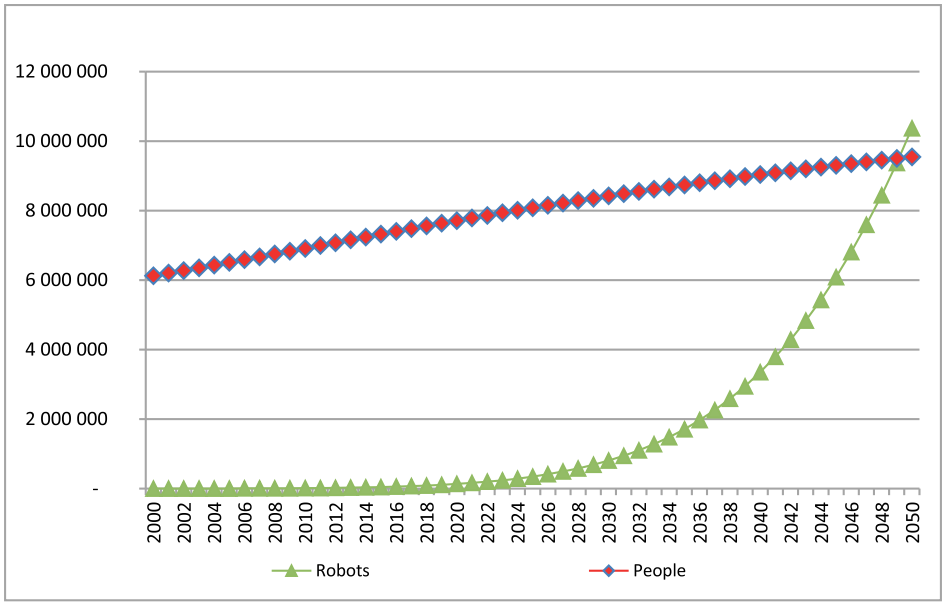


Fig. 9. The forecast of the evolution of the number of robots in the world.



Own prediction (using the Gompertz model) based on data from IFR

the multiplication of the growth rate of computers used (at least two times every five years) and the growth rate of the capacity of computer memory (about ten times in five years in accordance with Moore's law, see Moore 1965); multiplying this rate, we conclude that the number of stored data in the world can be increased at least four hundred times in each decade. Analyzing such large data sets, we can draw most diverse conclusions and applications, although of course the current uses are mainly commercial in nature, e,g. related to targeting marketing campanges.

However, it is still hard to talk about the universality of the use of knowledge engineering. Universal utilization will begin when software of knowledge engineering will be widely used in mental work, e.g., in automating office work. So far, state administration and local governments successfully defend themselves against excessive automation of their functions, so we should not expect a quick end of work in administration and in professions requiring personal contact, such as health care and teaching.

Another incoming wave, which has not yet reached the beginnings of a widespread use, the wave of biomedical engineering. Indeed, since the Röntgen (invention in 1895), increasingly more common is the use of various electronic methods of health care and research, but a universal and full use of information technology for the integration of such data and for supporting health services has not been achieved yet, see, e.g., (Granat and Klimasara 2014). This wave will also likely have serious social consequences.

6. Prognostic and general conclusions

The main conclusion of this article is the fact that the nature of social life will change in the coming waves of information revolution even more strongly than it has changed in the last thirty years. Especially dangerous is the process of positive feedback between the profits of businesses and achievement of high technology, especially in the wave of robotics. The processes of positive feedback speed up and end in hitting a constraint. A constraint in this case might be the end of work in enterprises and in services, which could cause serious social conflicts. It is therefore necessary to consider how to prepare society for the twenty-first century so fundamental and rapid changes in the structure of work. A serious reform of the capitalist system might be needed, based on the increased ethical requirements on businesses, as well as on a fundamental reform of the corporate tax system, see. Wierzbicki (2015).

Understanding the nature of the waves of the information revolution is therefore essential for understanding of future that awaits us. It follows that the students of all universities, including humanities, should be trained also in technical subjects related to the upcoming waves of information revolution: in robotics, computer science and engineering knowledge, finally in biomedical engineering.

Bibliography

Brynjolfsson E., McAfee A. (2014) *The Second Machine Age: Work, Progress, and Prosperity ina Time of Brilliant Technologies.* W.W. Norton &Company, New York

Debord G. (1967) *The Society of the Spectacle*, (English translation in 1970; rev. ed. 1977) Black & Red, London

Granat J., Klimasara E. (2014) System zdalnego monitorowania medycznego osób starszych i niepełnosprawnych – EDFAS. *Telekomunikacja i Techniki Informacyjne* 3-4/2014, str. 5-13

Grzegorek J, Wierzbicki A.P. (2010) *Metody analizy statystycznej rozwoju wskaźników społeczeństwa informacyjnego: aspekty metodologiczne oraz zastosowania na przykładzie regionów Polski i Włoch.* Conference Paper January 2010. KST Wrocław.

Grzegorek J. (2012) *Zastosowanie zaawansowanych metod statystycznych do badania rozwoju społeczeństwa informacyjnego w Polsce traktowanej jako system regionów.* Rozprawa doktorska, IBS PAN, Warszawa

Grzegorek J, Ziewiec B, (2015) *Estimated data of three ICT indexes available from GUS.* Dataset March 2015. DOI: 10.13140/RG.2.1.3652.3044.

Levy F. , Murnane R.J. (2012) *The New Division of Labor: How Computers Are Creating the Next Job Market.* Princeton University Press, Princeton, N.J.

McLuhan M. (1964) *Understanding Media.* Ark Paperbacks, London

Moore G.A. (1965) Cramming More Components onto Integrated Circuits. *Electronics Magazine* 38: 8: 4-10

Wierzbicki A.P. (2011) *Techne$_n$: Elementy Niedawnej Historii Technik Informacyjnych i Wnioski Naukoznawcze.* Komitet Prognoz „Polska 2000 Plus" PAN oraz Instytut Łączności (PIB), Warszawa

Wierzbicki A.P. (2015) *Przyszłość Pracy w Społeczeństwie Informacyjnym.* Komitet Prognoz „Polska 2000 Plus" PAN oraz Instytut Łączności (PIB), Warszawa

Leszek Kuźnicki[1]

DETERMINANTS OF HUMAN DEVELOPMENT[2]

Abstract

This article attempts to identify the main characteristics that underpinned the survival of *Homo sapiens sapiens*, as opposed to other primitive species of human.

Keywords: human development, determinants of development

Modern humans (*Homo sapiens sapiens*) belong to the family called hominids (Hominidae), which had its cradle in Africa, and to the genus *Homo*. Over the past three million years, a number of *Homo* species spread across Eurasia. The only extant species today is *Homo sapiens sapiens*, also referred to as the anatomically modern human (AMH). It emerged from a small population in Africa around 200,000 years ago, and it is genetically exceptionally homogenous, carrying only small admixtures of genes from the Neanderthal, Denisovan, and perhaps other Homo species.

Anatomically modern humans are characterized by a brain whose functional capacities have no match in nature, not even among the anthropoids, our closest extant relatives. Our brains allow us to be cognizant of the reality around us, much like the brains of other mammals, but we can also use words and abstract notions to describe that reality.

The human brain is the best adaptation to life in real time, and it simultaneously allows for abstract thinking and enables us to take past experiences into account in our life strategies as well as to try to anticipate the future. Therefore the brain was, and still is, a key determinant of human development.

Speech and the ability to make predictions, facilitated by the development of the brain, allowed *Homo sapiens* to develop adaptive behaviors in organized structures such as families, tribes, and societies. These social determinants of development, in turn, have also been crucial for the success of humankind in historical times.

In their book[3] exploring the origins of our species, Konrad Fijałkowski and Tadeusz Bielicki argued that the increasing volume of the hominid brain could be

---

1 Nencki Institute of Experimental Biology, Polish Academy of Sciences (PAS)

2 This article was originally published in the journal Przyszłość Świat-Europa-Polska, 3(39)/2017.

3 K. Fijałkowski, T. Bielicki, *Homo przypadkiem sapiens*, Warsaw 2008, Wydawnictwo Naukowe PWN, p. 302.

the result of stamina-based hunting, which means chasing the hunted animal until it suffered a heat stroke. The larger the brain of the hunters became, the better it was at acting as a "thermal buffer." In other words, they suggest that the hominid brain developed for reasons other than speech or abstract thinking – in other words, its development was a matter of "preadaptation". A notion advanced in the first half of the 20th century by Lucien Cuénot, preadaptation refers to the emergence of new organizational and functional traits that currently do not have positive adaptive importance, yet lay the groundwork for a future adaptation to a different environment. This book on *Homo sapiens* is largely a summary of Fijałkowski's numerous publications since 1978. The hypothesis put forward in it is one that can neither be proved nor refuted – as indeed is true for all hypotheses that refer to the idea of preadaptation. I do agree, though, with the first sentence of the book, which posits that "the emergence of humans was an extremely unlikely scenario." There are arguments that appear to offer reliable and compelling justification for this statement.

Over the past decade (2008–2017), we have witnessed significant advancements in the study of the history of humans (*Homo sapiens sapiens*) and their close relatives: the Neanderthals and the Denisovans. These advancements have resulted from the rapid development of archeogenomics.[4] It was back in 1856 that a skull and long bones were found in a valley called Neanderthal outside Düsseldorf, Germany. They belonged to a man who had lived in the distant past and was anatomically different from modern humans. From that year onwards until the early 21st century, our knowledge about anthropogenesis was largely based on comparative analyses of fossil remnants and implements made by hominids for utilitarian and artistic purposes. Nowadays, however, fundamental progress has been made in this field thanks to the technique of obtaining nuclear and mitochondrial DNA from the bones of individuals that lived even in a very distant past.

Comparing DNA sequences makes it possible to analyze with a high degree of accuracy and precision how extinct organisms were related over time to one another and to modern organisms. Based on such findings, we can establish with certainty whether remnants found at different sites belonged to individuals of the same species or of different species. With access to the fossil record, archeogenomics even makes it possible to read evolutionary trends.

Based on the excavations discovered so far and the archeogenomic techniques used to analyze them, we know that within the past 200,000 years the Earth has been inhabited by genetically varied hominid populations. This included species that were anatomically heterogenous, such as the burly *Homo erectus* and the miniature *Homo floresiensis*. Evolutionarily more advanced that these two species were *Homo heidelbergensis*, as well as three varieties of *Homo sapiens*: modern humans (*Homo sapiens sapiens*), the Neanderthals (*Homo sapiens neanderthalensis*), and Denisovans (*Homo sapiens denisovianensis*) – anatomically

[4] I. Stolarek, M. Figlerowicz, "Homo sapiens w Europie – historia zapisana w DNA," *Nauka*, no. 3, 2016, pp. 7–25.

different varieties of the same species. The Neanderthals inhabited Europe and West Asia, the Denisovans lived in Southeast Asia, and anatomically modern humans came from Africa to Eurasia in at least two migrations. Individuals from these three varieties of *Homo sapiens* interbred sporadically, the traces of which can still be found in the genomes of modern humans.

Of these species, evolutionary success would only achieved by *Homo sapiens sapiens*, chiefly as a result of the second migration, which took place around 45,000 years ago. The remaining two varieties of the *Homo sapiens* species became extinct. Evidence of the presence of the last known Neanderthals, found in Gibraltar, dates back to around 30,000 years ago. We have, as yet, no concrete knowledge of the direct causes of the extinction of the Denisovans and Neanderthals. However, Neanderthals lived in the regions in Europe and Asia that were inhabited by anatomically modern humans during their migrations from Africa. It is difficult to tie their extinction to climate change (glaciation) – *Homo sapiens sapiens* survived in those very same harsh conditions.

All the three varieties of *Homo sapiens* were hunter-gatherers and led a nomadic lifestyle. Neanderthals had larger brains and were sturdier than anatomically modern humans. Judging by the products their material culture, we can conclude that they were no worse in this respect than anatomically modern humans. The evolutionary success of our ancestors must have been ascribable to other, additional factors.

These probably included the migratory urge and the scale of migrations. In certain periods, migrations were the result of climate change and occurred in all the varieties of *Homo sapiens*. However, the migrations of anatomically modern humans were global in scale, coming to encompass all the continents save for Antarctica, and often spontaneous. Also, the success of anatomically modern humans must have been determined by individual and social characteristics. I addressed this problem a few years ago, at the "Poland 2000 Plus" Foresight Committee's conference on "Challenges of the Future: Opportunities and Threats." My considerations were included in the Committee's publication,[5] and their main idea can be summarized as follows:

"Humans – *Homo sapiens sapiens* – have achieved remarkable evolutionary success and become the dominant species across the globe, while other species of the *Homo* genus became extinct. That success has been determined by brain development and the urge to form organized social structures, which led to the emergence of human civilization. The author agrees with Charles Pasternak, who sees cognition as the essence of humanity. It is cognition, along with the creative potential contributed by science and technological advancements, that guarantees humanity's continued success."[6]

---

[5] L. Kuźnicki, "Przyszłość intelektualnej ewolucji człowieka," in *Wyzwania przyszłości – szanse i zagrożenia*, eds. J. Kleer et al., Warsaw 2010, PAN Komitet Prognoz 2000 Plus, pp. 392–397.

[6] Ibid., p. 392.

The Neolithic Revolution, linked to the emergence of agriculture and the first stable human settlements, took place some 8,000-12,000 years ago. The development of the first civilizations in the Nile River Valley and between the Tigris and Euphrates began just 5,000 years ago. From the perspective of the history of *Homo sapiens sapiens*, the emergence of the first civilizations can already be considered modern history. Since that time, the biology of humans and their brains cannot have changed, because natural selection no longer applies among contemporary societies, and even if it did, its effects would not be manifest in view of the short time span.

From the biological perspective, we are hunter-gatherers who have created favorable urban and agricultural environments for ourselves and settled there. Our exceptional brains have allowed us to quickly adapt to these new conditions. In many cases, however, we still behave much like our nomadic ancestors. For example, many people feel anxiety when they see harmless spiders or fast-moving but non-menacing animals such as slowworms (a kind of legless lizard, resembling a snake) or cockroaches. The word innate can be used to describe not only such traits and individual behaviors, but also mutual relations between members of societies that emerged in hunter-gatherer populations.

Humans can be taught both empathy and aggression, especially when such education starts in childhood. There is evidence that reciprocity was a universal principle of moral agency. In the tribal societies in which *Homo sapiens sapiens* evolved, sharing of feelings among individuals from the same group was always a beneficial adaptive reaction, especially in terms of survival and reproduction, which means the maximization of fitness (increasing an individual's reproductive success).

Depending on the local conditions in which hunter-gatherers lived, the populations became diversified, forming different material cultures. The durability of those communities was determined by advancements in hunting techniques as well as organization and collaboration within populations.

There is ample evidence to support the argument that the maintenance of distinctiveness in tribal communities must have oftentimes been coupled with discrimination against outgroupers and entire groups regarded as rivals. The evolutionary success of *Homo sapiens sapiens* has been determined, therefore, to equal extents by the ability to collaborate with others of "our own kind" and by aggression towards strangers. The emergence of societies lent special significance to collaboration and conflicts both within groups and between different communities.

Bibliography

Fijałkowski K., Bielicki T., *Homo przypadkiem sapiens*, Warsaw 2008, Wydawnictwo Naukowe PWN

Kuźnicki L., Przyszłość intelektualnej ewolucji człowieka, in *Wyzwania przyszłości – szanse i zagrożenia*, eds. J. Kleer et al., Warsaw 2010, PAN Komitet Prognoz 2000 Plus

Stolarek I., Figlerowicz M., Homo sapiens w Europie – historia zapisana w DNA, *Nauka*, no. 3, 2016

Irena Głuchowska[1]

WHERE ARE WE HEADED? REFLECTIONS ON CIVILIZATION, CULTURE, AND EDUCATION

Abstract

The reflections offered in this chapter are one attempt to perceive our social problems in a new light. We take stock of major international and Polish educational initiatives, including education for the sake of peace, suggesting the need for their further analysis and evaluation. As the borders of every human being's responsibility for the survival of the human species are shifting closer and closer, we argue that it is worth pondering the overriding values necessary for the peaceful and harmonious coexistence of humans and groups of people, setting goals that we can strive for together as humans, and discussing the directions and quality of socialization. All this points to the importance of investing in universal humanistic education – such that more people will ask themselves "What can I do?" rather than "What is going to happen?"

Keywords: civilization, culture, education, future studies

1. Introduction: The scope of these considerations

"For whom and what are humans responsible?" – this was the main question addressed at the seminar held by the "Poland 2000 Plus" Foresight Committee in 2017. Finding an answer to this question, which is by no means an easy task, is turning into an urgent and immediate "call to action," the last lifeline that keeps us from drowning. Protecting the Earth's biosystem as well as our fellow humans, both as living organisms and as creators of culture and civilization, requires all of us to act. We have our backs to the wall, and either we mobilize to take peaceful measures to recultivate our natural and cultural environment or... well, there is no other way. Moving to another planet or planetary system is hardly realistic.

Counteracting environmental degradation, violence, evil, poverty, wars, and terrorism is not a new test facing people, our institutions and various organizations, especially international ones. We entered the 21 century confronted with a major challenge posed by terrorism and alarmed by its growing intensity and changes in its forms. But what are the causes of terrorism? Who are the terrorists? Why do they knowingly sacrifice their lives in terrorist acts? What can be done to prevent the escalation of violence as well as the death and suffering of many innocent people? Are changes in civilization and culture linked to the growing intensity of

[1] Warsaw School of Economics

violence and terrorism? What steps should be taken to prevent all these tragedies and misfortunes?

Terrorism, along with its causes, methods of action, and consequences, requires in-depth analysis from different perspectives (including sociological, psychological, economic, anthropological, political, and military). In the globalizing social world, we must take into account different sides of violence-generating conflict, especially the motives of terrorists and those who are hiding behind them. Is it possible to peacefully resolve such conflicts and disputes between people, societies, nations, cultures, and religions? Are education, upbringing, and preventive measures effective in countering the intensification of terrorism? Does counter-terrorism education, if taken seriously (systemically prepared and designed to reach every corner of the globe), perhaps still make sense?

I will not attempt to resolve these questions here. Rather, the reflections I offer in this chapter on civilization, culture, and education are just the tip of the iceberg – we must climb it, look around, and strive to perceive our social problems in new dimensions. In these considerations, therefore, I will especially draw upon the knowledge of great humanists, along with their projections and warnings, who undertake many pedagogical initiatives imbued with humanistic values and concern for the world's future. In addition, I will present major international and Polish educational initiatives, simultaneously suggesting the need for their more in-depth analysis and evaluation.

I will not comment on the concept or implementation of new school curricula. The Polish Ministry of National Education published a new core curriculum in February 2017, and new textbooks are hastily being written. One would presume that environmental protection and education for safety will be important goals in the field of education. However, speaking about goals requires a careful analysis of the textbooks and methods for teaching specific subjects and curricula. In this sense, I see a need for humanistic values and peace-minded education. I am convinced that steps should be taken to evaluate the efforts made so far to ensure the peaceful coexistence of different nations, religions, and cultures and to translate theoretical knowledge, the results of empirical research, and important humanistic ideas into concrete educational projects aimed at fostering greater tolerance for "otherness" and understanding for cultural diversity. However, we must not remain silent about the hidden and important causes of conflict, rooted both in the human psyche and in economic and political mechanisms.

2. Where are we headed? What is our nature?

For many generations, people, or at least those who are involved in the exchange of knowledge about humans and their culture, have shared a common belief that culture does not appear out of nowhere, nor is it bestowed upon us, humans, once and for all – rather, we ourselves keep culture pertinent through our

own involvement. It is we humans who generate and have always generated culture; it is we humans who create symbols and change civilizations.

Our ancestors did not know that they were creating culture, but they were more or less consciously involved in the socialization of subsequent generations, participating in the transmission of cultural goods and values. Nowadays we are aware of the importance of human interaction, different methods of disseminating culture, and mechanisms of socialization and education. We are likewise aware of different techniques of controlling society and different ways of manipulating people. We know a lot about people's good and bad sides. We also know that the social reality is not uniform, nor is it always friendly to us, humans. Although we form a global village, as Marshall McLuhan put it,[2] we do not always feel comfortable or safe in it.

We are increasingly aware of different dangers and threats. At the same time, however, we hear assertions on all sides that nothing can be done, that the world has gathered momentum and is rushing in an unpredictable direction, or essentially in different directions. Everything has already happened, says Jean Baudrillard,[3] and we are controlled by objects, which seduce us and have power over us. Zygmunt Bauman[4] argues (along with many other careful observers of our civilization and the modern-day culture) that we no longer live in the modern era, whose development could be controlled or at least described in a logical way. Rather, we now live in the era of postmodernity, in a culture dominated by freedom and unlimited choices of (rapidly changing) lifestyles and values with no moral signposts or authorities. Everywhere we hear the word: globalization, globalization, globalization. It is an element that cannot be controlled or harnessed, and it is essentially impossible to plan anything.

In the past, culture was seen as a system, harmony, homeostasis. Culture served people, fulfilled specific functions, and satisfied various human needs, especially by serving the purpose of integration[5] – although some, like Sigmund Freud, saw it as a source of suffering. It is now said that suffering has its source in postmodernity (as the title of Bauman's book suggests).[6] It is increasingly believed that culture does not to have to be a system. Culture is chaotic, and it resembles a matrix composed of many equipotent values, or a mandala. Culture, then, is the freedom to choose from the boundless universe of values.[7]

---

2 M. McLuhan, *Understanding Media: The Extensions of Man*, New York 1964.

3 as cited by K. Wilkoszewska, *Wariacje na postmodernizm,* Kraków 1997, in the chapter "Postmodernizm w filozofii – Jean Baudrillard," pp. 71–84.

4 Z. Bauman, *Postmodernity and its Discontents*, Polity Press, 1997.

5 Z. Bauman, *O szansach i pułapkach ponowoczesnego świata*. In: *Materiały z seminarium Profesora Zygmunta Baumana w Instytucie Kultury*, ed. A. Zeidler-Janiszewska, Warsaw 1997, pp. 58–73.

6 Z. Bauman, *Postmodernity… op. cit.*

7 *Op. cit*. see above.

In the postmodern world, humans are compared or reduced to the role of vagrants and/or tourists. So the questions arise: Where are we headed? For what purpose? Are we satisfied? Are we fated to be alone? Are we happy?

Such a world, being posited no longer only by futurists, is strange, incomprehensible, and mysterious, but also terrifying. Does it really mean that nothing can be done? Is this state inevitable? If we also factor in the present, with its wars, poverty, intolerance, diseases, and terrorist attacks, all of which also make up the universe of our civilization, we will arrive at a picture of the world that a human with prosocial attitudes and imbued with humanistic values would surely like to forget about as soon as possible, and to turn by magic into a world that is friendly to people and nature, to everyone.

3. Diagnoses, forecasts, warnings

Back in the 20th century, numerous attempts were made to counter various threats. Interdisciplinary scientific reports were written, warning against the degradation of the natural environment, the depletion of natural resources and energy sources, and so on.

In 1972, the Club of Rome published a report entitled *The Limits to Growth*. It signaled a global catastrophe, warning people against the imprudent exploitation of natural resources – a catastrophe that would occur if the world continues to develop based exclusively on economic, quantitative criteria. This alarming forecast shows the limits of growth. It mentions the positive impact in the form of considerably longer life expectancy but also looks critically at the poor quality of life. The fact that millions of people still live in poverty is terrifying. The report also lists the results of the Industrial Revolution, which contributed to the supply of low-cost workforce yet generated the serious problem of unemployment and threats to the natural environment. The report proved an important warning against the consequences of economic exploitation pursued by humans. It called for moderation, prudence, and respect for the natural environment.

Subsequent reports have highlighted the role of education in the processes of the development of societies and the struggle for peace in the world. Such documents called for measures aimed at creating conditions for the emergence of a learning society, education for peace, and a humanistic civilization based on knowledge and information.

The UNESCO report written by Edgar Faure et al. entitled *Learning to Be: The World of Education Today and Tomorrow*[8] emphasized the need for education on coexistence and collaboration with others as a necessary condition of the safe existence of human beings. In its preamble, the report expresses its concerns about

[8] Report of the International Commission on the Development of Education, published in 1972.

the dehumanization of the world. It also asserts that the existential aspect of everyday life should manifest itself in the empowerment-based approach to personal development.

In 1979, in turn, the Club of Rome published the report entitled *No Limits to Learning: Bridging the Human Gap*, which included the concept of lifelong learning (the report referred back to *The Limits of Growth*).

Different concepts of human development have been developed in laboratories and studies of scholars, and various projects have been posited to harness new technologies and scientific accomplishments in the service of humans. All to no avail. The chasm between technological civilization and humanistic civilization, described so vividly and persuasively by Bogdan Suchodolski,[9] is widening. Indeed, This has been noted in consecutive publications written by concerned scholars.

In 1981, the Club of Rome issued Aurelio Peccei's report *One Hundred Pages for the Future*, which pointed to diversified socioeconomic and cultural growth. The publication was guided by the idea "act locally, think globally." Aurelio Peccei refers to the young generation, arguing that the world's future is in the hands of young people, who should understand threats and find ways to save the world.

In 1996, another report was published: *Learning: The Treasure Within.* Its lead author, Jacques Delors, stresses the importance of the new quality of education. Here, we should point out to four pillars of education:

- learning to know,
- learning to do,
- learning to live together, to live with others,
- learning to be.

In 1995, a team led by Javier Pérez de Cuéllar wrote the UNESCO report entitled *Our Creative Diversity*. It argues that the imperative for education derives from the dialectic of community and diversity. What is important is the creative diversity of identity and local cultures. Cultures must be protected against globalization, marginalization, and degradation.

Another UN initiative involved compiling the report entitled *In From the Margins* on 1998. It could be described as supplementary to a report written for the Council of Europe (CoE) by the European Task Force for Culture and Development.[10] The report's central themes are "two interlocking priorities: to bring the millions of dispossessed and disadvantaged Europeans in from the margins of society, and cultural policy in from the margins of governance." The report highlights the role of culture as a factor behind social advancement and social integration. The role of culture in education for tolerance and peace is not without importance in this context.

---

[9] B. Suchodolski, "Dramat upowszechniania kultury," in *Współczesne dylematy upowszechniania kultury: Materiały z konferencji*, ed. J. Gajda, Lublin 1991, pp. 8–19.

[10] *In From the Margins* is treated as a supplement to the report *Our Creative Diversity.*

Further deliberations on the problems faced by the modern-day world and the need for more intensive and systematic educational action were undertaken by the "Poland 2000" Foresight Committee affiliated with the Presidium of the Polish Academy of Sciences (PAS), later renamed the "Poland 2000 Plus" Committee, then the Foresight Committee "Poland in the 21st Century."

Among many topics of the conferences organized by the Foresight Committee affiliated with the PAS Presidium, subsequently summed up in published volumes, we can name two directly linked to the education of the future:

- Culture as an Inspiration for General Education,[11]
- the Ethos of Education in the 21st Century.[12]

In her introduction to the first of these publications, Irena Wojnar writes: "There is a strengthening conviction that from the perspective of the world's further existence and development, it is necessary to intensify what is referred to as the human factor, or the creative presence of thinking, sensitive, and active humans, individuals and groups. (...) From the perspective of the reality of the postulated democracy and the new world order, education emerges as a tool and as a chance for the planned social changes focused on humanistic values, or the properly understood freedom, pluralism, tolerance, and human rights. (...) Education should lead to the development of culture in people."[13] These reflections are an obvious continuation of the concept contained in Suchodolski's *Wychowanie dla przyszłości* [Education for the Future], which called for the development of education and culture, stimulated by the personal actions taken by people in the service of humanistic civilization. Neil Postman, in trn, pins certain hopes on change in the world, on education that takes advantage of cultural goods.[14]

In Poland, the following concepts have emerged: education for art and through art, esthetic education, cultural education, intercultural education, and so on. Efforts were made to put into effect the Interministerial Program of Cultural Education, which highlighted strong links between the values of symbolic culture, ecodevelopment measures, cultural education, peace, tolerance, and anti-discrimination measures.[15] In 1998, Janusz Gajda urged the treatment of culture as *regnum homini*, as opposed to the treatment of culture in market terms. Maybe we should return – or perhaps we even must return – to the concepts that have already been worked out in the realm of the pedagogy of culture?[16]

---

11 *Kultura inspiracją kształcenia ogólnego*, a collective volume edited by I. Wojnar and J. Kubin, Warsaw 1998.

12 *Etos edukacji w XXI wieku*, a collection of studies edited by I. Wojnar, Warsaw 2000.

13 *Kultura inspiracją kształcenia ogólnego*, Warsaw 1998, eds. I. Wojnar and J. Kubin, introduction

14 N. Postman, *Technopoly: The Surrender of Culture to Technology*. New York: Knopf, 1992.

15 The document was adopted on 27 November 1966 by the Council of Ministers of the Republic of Poland. Those who contributed to the development of the program included in particular: Assoc. Prof. Wiesława Pielasińska and Agata Bielawska, director of the Department of Cultural Education at the Polish Ministry of Culture and Art.

16 The chapter "Kultura jako regnum homini i kultura w kategoriach rynku – wyzwania dla edukacji," in *Kultura inspiracją kształcenia ogólnego*, *op. cit*.

4. Education for peace

The preamble of the UNESCO Constitution of 1945 stipulates that "since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed."[17] Ettore Gelpi, in turn, argues that the culture of peace cannot be exclusively a culture of negation, but rather "should be a culture of community on the global scale," a culture of opposing violence in various forms, in interpersonal relations and between groups."[18] Indeed, those who have spoken out in the discussion about the future of the world and the role of education in the improvement of the world have included the likes of the Italian thinker Umberto Eco.[19]

In the wake of the great tragedy of the terrorist attack on the World Trade Center on 11 September 2001 that claimed the lives of thousands, there began to be much discussion on terrorist threats and the ways to counter them. Blame started to be placed on Islam and the culture that had its roots in Islam. But there were also voices that blamed the culture of the West. In his *Holy Wars, Passion and Reason, Scattered Thoughts on Cultural Superiority*, polemicizing with the arguments of Italian Prime Minister Silvio Berlusconi, who professes the superiority of the Western culture over Islam, Umberto Eco pointed out the West's unilateral approach to Islamic culture and the resultant threats for the education of the new generation of young Europeans. He writes that "[w]hat isn't incidental, and should worry everyone – politicians, religious leaders, educators – is that certain declarations, or even entire impassioned articles that have somehow justified them, become a subject for general debate, occupy the minds of young people, and perhaps induce them to fervent conclusions in the heat of the moment. It is our young people I am concerned about, as it is too late now to teach the old ones any new tricks. All the religious wars that have bloodied the world for centuries are born from vehement adhesion to simplistic opposing views, such as 'us' and 'them', good and bad, black and white. (...) One element of confusion is that we often fail to grasp the difference between identifying with our own roots, while understanding that other roots also exist, and the ability to distinguish between good and bad."[20]

Eco also points out to the importance of the objective analysis of differences between civilizations, "because that's the point in hand." Referring to the methods

---

17 http://portal.unesco.org/en

18 Gelpi, E. (1992) *Conscience Terrienne – Recherche et Formation*. Firenze: McColl Publisher. See above *op. cit*.

19 e.g. in Poland in *Gazeta Wyborcza*, 13–14 October 2001, article "Święte wojny, pasja i rozum". See the next footnote.

20 Umberto Eco, *Holy Wars, Passion and Reason, Scattered Thoughts on Cultural Superiority*, Quaderns de la Mediterrània, 10. Intercultural Dialogue between Europe and the Mediterranean/El diálogo intercultural entre Europa y el Mediterráneo, IEMed, Barcelona, 2008, pp. 29-36, https://www.iemed.org/publicacions/quaderns/10/q10_029.pdf

of anthropological research of different cultures, Eco urges us to follow their example. "The real lesson that should be learnt from cultural anthropology is rather that in order to assert that one culture is superior to another, we need to set some parameters. Describing what a culture consists of is one thing, but saying which parameters we judge it on is something else entirely. (...) The parameters for judging them, however, are something else entirely. They depend on our roots, our preferences, our customs, our passions, and on our system of values."

While asking himself if there are superior and inferior cultures, Eco answers: it's not so simple. However, one thing is certain: the peaceful coexistence of different cultures requires tolerance for diversity, mutual understanding, education, and acceptance of differences.

Learning to understand different cultures involves mutual observations and mutual peaceful contacts. Through such reflection, we learn a new method of getting to know other cultures, learning to tolerate them, and accepting differences. Eco proposes the implementation of what is referred to as alternative anthropology, which facilitates the exchange of researchers from different continents and cultures for the purpose of conducting their own anthropological research. (For some years now, the international organization Transcultura has been campaigning for "alternative anthropology.")

Here, it seems that we simply must quote a statement by Irena Wojnar's statement.[21] In the chapter "*Kształtowanie kultury pokoju – zobowiązaniem edukacyjnym na XXI wiek*" [Shaping a Culture of Peace as an Educational Duty for the 21st Century] whose title, as I believe, may (and even should) provide an inspiration for the identification of the most important tasks for the people who live in the 21st century, she writes: "We can observe a special intensification of ethical controversy that has dangerous consequences for public life and the life of individuals. Over the past decade, there have been growing, new manifestations of the absence of transparency in the world and the confusion experienced by man, scared by the limitless horizon of freedom."

Numerous variants of new nihilism are intensifying moral indifference, desensitization, and consumption-based models of life, sanctioning signs of violence in different forms. The trend described by Konrad Lorenz as "the waning of humaneness" is growing in strength.[22] Alain Finkielkraut analyzes the phenomenon of "lost humanity" in the times of the intensification of evil, cruelty, and "*la souffrance inutile*" (unnecessary suffering).[23]

In the globalized world, violence in different forms scores easy and spectacular victories, justifying a certain need, or perhaps even the necessity of raising in a modern and interdependent way the problems of "repairing the world" and "repairing man," as John Amos Comenius put it so many years ago, in

[21] *Etos edukacji w XXI wieku*, *op. cit*., pp. 16–17.
[22] K. Lorenz. *The Waning of Humaneness*, 1983.
[23] A. Finkielkraut, *L'humanité perdue*, 1966.

analyzing "the labyrinth of the world" and "the paradise of the heart."[24] After all, wars are waged both in the world and "within man," as Erich Fromm argued.

In 1996, another UN initiative for peace was taken. An attempt was made to work out the project of education for peace. It is worth stressing that it was not the first initiative of this kind. We owe the beginnings of education for peace to Maria Montessori (1870–1952), who was active in this field in the 1930s. Those who continue her work notice a strong need for action for the promotion of the culture of peace, whose scope covers numerous aspects – it is meant to boost sensitivity to the values of local culture and the protection of monuments, highlight cultural ecology, and cultural education for the defense of the values of peace.[25]

We share the views expressed by Wojnar and Suchodolski and therefore feel obliged to repeat after those prominent humanists that the culture of peace should be seen as a fundamental factor behind the ethos of education in the 21st century. In 1983, Suchodolski formulated conclusions that are still valid: "Education for the sake of peace means shaping people's awareness and attitudes in a such a way as to enable them to work together to overcome different threats to peace, which have their source in the human psyche, ideological systems, the world's social and political reality, injustice and harm as well as conflicts that have material justifications." Suchodolski called for the implementation of two complementary and interrelated tasks. He described these tasks as "harmony in the world" and "harmony within people."[26]

5. What is to come?

All warnings of a crisis of values and all calls for peace of tolerance can, of course, be ignored. But not indefinitely.

We can say that certain ideas are utopian, that nothing can actually be done, that people are in fact helpless. Culture and civilization have spun out of our control. Everything has been objectified. I believe, however, it is instead high time for a global social contract that will embrace all the fundamental principles of peaceful coexistence and cooperation between nations, societies, and countries as well as fundamental guarantees of the implementation of these principles.

It is therefore worth pondering the overriding values necessary for the peaceful and harmonious coexistence of humans and groups of people. It is worth setting goals that we can strive for together as humans. It is worth discussing the directions and quality of socialization. It is worth working out methods and techniques of education that could lead to positive changes in the local surroundings and in the world in which we live. It is also worth investing in universal humanistic education.

---

24 J. A. Comenius, *Labirynth of the World and Paradise of the Heart*, 1631

25 *Etos edukacji w XXI wieku*, *op. cit.*, pp. 17–30.

26 *Op. cit.*, pp. 16–17.

Maybe what I am writing about is another utopia? Nevertheless, there are more and more people who are advocating a social contract in this (or a similar) form. Federico Mayor, former director-general of UNESCO and author of the social analysis and forecast included in the report *The World Ahead: Our Future in the Making*, cites the words of Denis de Rougemont: "The decadence of a society begins when people ask: *What is going to happen?*, instead of asking themselves *What can I do?*"[27] The borders of every human being's responsibility for the survival of the human species are shifting closer and closer towards us, and alarm bells are ringing louder and louder.

Bibliography

Bauman Z., *O szansach i pułapkach ponowoczesnego świata*. In: *Materiały z seminarium Profesora Zygmunta Baumana w Instytucie Kultury*, ed. A. Zeidler-Janiszewska, Warsaw 1997.

Bauman Z., *Postmodernity and its Discontents*, Polity Press, 1997.

Botkin J.W., Elmandjra M., Malitza M., *No Limits to Learning: Bridging the Human Gap*, The Club of Rome, 1979.

Comenius J.A., *Labirynth of the World and Paradise of the Heart*, 1631.

EcoU., *Holy Wars, Passion and Reason, Scattered Thoughts on Cultural Superiority*, Quaderns de la Mediterrània, 10. Intercultural Dialogue between Europe and the Mediterranean/El diálogo intercultural entre Europa y el Mediterráneo, IEMed, Barcelona, 2008.

Etos edukacji w XXI wieku, a collection of studies edited by I. Wojnar, Komitet Prognoz "Polska 2000 Plus" PAN, Warsaw 2000.

Finkielkraut A., *L'humanité perdue*, 1966.

Gelpi, E. (1992) *Conscience Terrienne – Recherche et Formation*. Firenze: McColl Publisher.

http://portal.unesco.org/en

Kultura inspiracją kształcenia ogólnego, a collective volume edited by I. Wojnar and J. Kubin, Komitet Prognoz "Polska 2000 Plus" PAN, Warsaw 1998.

Learning to Be: The World of Education Today and Tomorrow, International Commission on the Development of Education, 1972.

Learning: The Treasure Within, UNESCO, 1996.

Lorenz K.. *The Waning of Humaneness*, 1983.

Mayor F., *The World Ahead: Our Future in the Making,* 2001.

McLuhan M., *Understanding Media: The Extensions of Man*, New York 1964.

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W., *The Limits to Growth*, Universe Book, 1972.

[27] Federico Mayor, *The World Ahead: Our Future in the Making,* 2001. The report is based on a careful analysis of documents, statistics, and studies by international institutions and prominent experts and uses the databases, reports, and documents of UNESCO and its specialized institutions and agencies.

N. Postman, *Technopoly: The Surrender of Culture to Technology*. New York: Knopf, 1992.

Our Creative Diversity, Report of the World Commission on Culture and Development, UNESCO, Paris 1995.

Peccei A., *One Hundred Pages for the Future. Reflections of the President of the Club of Rome*, The Club of Rome, 1981.

Suchodolski B., "Dramat upowszechniania kultury," in *Współczesne dylematy upowszechniania kultury: Materiały z konferencji*, ed. J. Gajda, Lublin 1991.

Święte wojny, pasja i rozum, *Gazeta Wyborcza*, 13–14 October 2001.

Wilkoszewska K., *Wariacje na postmodernizm,* Kraków 1997.

Konrad Prandecki[1]

FACTORS AFFECTING THE AVAILABILITY OF FOOD IN 2050

Abstract

Population prospects and increasing risk of emergence of limits to growth mean that food safety hazards are becoming more realistic. The goal of the study is to find the most important factors influencing the future food security.

Until 2050 the demand for food is expected to increase by at least 70%. It is due to growing number of people and rapid changes in developing countries.

Forecasts allow the conclusion that it is possible to ensure a sufficient increase in the supply of food that will satisfy the need for additional billion people, and suffering from malnutrition. However, it is associated with the need to increase the focus on economic and social aspects of the food economy, i.e., among others, greater trade openness, the growing importance of producers at the expense of intermediaries, increase the social attractiveness of work in agriculture and reducing food waste. These conditions are as important as the fight against climate change (in particular water scarcity and soil erosion) or technological improvement of agricultural productivity.

Keywords: Food in 2050; food security; climate change; agriculture

1. Introduction

Apart from access to water, shelter and health, food is one of the basic human needs. In order to fully comprehend its importance, one may just imagine the consequences of a few days without it. In large cities, it would lead to the depletion of stocks in shops. The problem of malnutrition is a significant challenge in many developing countries. It is estimated that it concerns over 800,000,000 people in the world. The issue is nearly unnoticed in highly-developed countries, as the high purchasing power of households results in a small participation of food costs in the basket of consumed goods. The wealth of these countries also causes the supply of food exceed the demand, making food easily available to customers.

However, considering the expected further growth of the world population and the increasing probability of facing developmental limits, more and more voices are warning that ensuring access to food might become one of the fundamental challenges for mankind in mid-21st century (GH, 2013; IAASTD,

[1] Institute of Agricultural and Food Economics National Research Institute

2009). Analysts point out that the fears expressed by the 19th-century economist T. Malthus, concerning the inability to feed the growing population might actually come true, as it is impossible to further increase the area of arable land (MA, 2005).

In view of the above, the search for the possibilities of long-term food provision is an important element of civilisation development. In this respect, it is not only important to determine if there will be enough food to satisfy the needs of all people, but also how economic changes will affect food consumption. Development of a global food security scenario should take into account not only the technical capacity for food production, but also social attitude. The goal of the study is to find the most probable development path of food trends in the perspective of the year 2050.

The paper was based primarily on critical analysis of existing literature and statistical data. The multi-faceted nature of the discussed topics has made the author abandon the presentation of scenarios, and rather focus on the factors most strongly influencing the future food security.

2. Preliminary Assumptions Concerning the Living Conditions in 2050

The analysis of future trends in the evolution of agriculture and food economy requires not only the knowledge of processes occurring in those sectors, but also studying the changes in their environment. Some occurrences affect not just the demand for food, but also its supply. In most cases, it concerns rather unlikely situations that may be referred to as black swans. One may list among them such event as the Earth being hit by a large meteorite destroying the human civilisation. The probability of such event is negligible, and astronomers assessing the risk of collision with various space objects have the possibility of warning people in advance, thus enabling remedial action. Another group of threats that should be eliminated from the forecast are global natural disasters. It concerns occurrences of a very large scale, affecting people all over the planet. This usually includes volcano eruptions. An adequately large scale of atmospheric pollution may cause a global reduction in agricultural production lasting a few years. In the case of so-called “supervolcanoes”, the consequences may lead to the extermination of mankind. Obviously, eruptions of such magnitude are extremely rare, but it is worth to remember that contemporary science cannot predict them. For this reason, one needs to be aware of the possibility of such occurrence, but structuring scenarios of agricultural development on the basis of such factors is not justified. Their probability is too low, and the consequences too extensive to be properly considered.

A much more probable situation is a global civilisation conflict. As the cold war ended, people got used to the thought that there are no more reasons for

a military confrontation of world powers. However, with the rapid growth of China and its assumption of a leading role in the economy, there are more and more frequent political tensions between the USA and PRC. The two countries differ profoundly in terms of culture, which makes their attitude to the same issues completely different. It is noticeable in the UN Security Council, where China often makes decisions other than expected in the Western culture. As the economic power of China is consolidating, and so are its links with other countries, e.g. in Africa or Central Asia, the political position of this country is also rising, even though the Chinese are strongly against treating them as a superpower, explaining it with incomplete transformation and internal problems. Nevertheless, their influence on the world economy is still huge (Brunet and Guichard, 2011).

The USA, on the other hand, are slowly becoming aware of their imminent loss of economic leadership, which will probably happen around 2025 (O'Neill, 2012). It seems that they still are not ready to lose the political supremacy and become only the second power in the world. However, all forecasts of economic changes by 2050 include such option (ADB, 2011; Buiter & Rahbar, 2011; O'Neill, 2012; OECD, 2012; Ward, 2012). As a result, one may notice a growing American interest in cooperation with East Asia, most particularly the ASEAN countries. This attempt of creating an American zone of influence in East Asia is viewed by China as an endeavour to establish a new division of the world against the Middle Kingdom. It should be expected that in the future, the tension between PRC and USA intensifies. This will increase the threat of a global war, maybe even more than in the case of USRR-USA relations, as today, there are no established rules of consultation between superpowers (Goldstein, 2013). However, starting a global war seems improbable, as for both sides, the prospective benefits would be highly surpassed by the costs. In the global politics, Russia is still a great unknown. Upon introducing certain economic reforms, it may reinstate itself as a world power, or it may gradually lose its significance. From the point of view of the global food policy, transformations in this country may be of importance. It should definitely be stated that the probability of Russia initiating a global conflict is minor.

It was assumed that apart from transitory periods of regression (as in the case of the attacks of September 11, 2001 in the USA), globalisation processes will still progress. It is extremely important for our further analysis of changes in access to food, as it enables global, rather than only regional problem-solving.

From the point of view of the entire planet, local and regional wars are unimportant, as they only lead to temporary problems. Their scale may be as large as, or even larger than today, which means that hundreds of millions of people will still suffer due to limited access to food, but it will not result in permanent global perturbations.

The scenarios also assumed that by 2050, there will emerge no real global executive power with reference to food – i.e. no form of world government. It is assumed that the basic units taking action will be independent countries. On the one hand, its authority will most probably be limited by transnational corporations,

but on the other, a growing interest in authoritarian developmentalism allows the claim that the effectiveness of state power will be similar to that of today. The emergence of a global government might improve the situation of people having limited access to food, but the aforementioned civilisation differences (mainly concerning the rice versus wheat-corn civilisations[2]), the odds of such institution being established are remote.

An important element demanding analysis is the question of sustainable development. Global economic challenges connected with growth limits and the current political trends encourage many analysts to consider scenarios based on this concept (Paillard et al., 2011). Such approach seems desirable, though the forecasts of global consumption (Prandecki et al., 2013) and changes in social attitudes clearly show that in the absence of a rapid, large-scale catastrophic event, there is no chance for any change in social attitudes and uniting mankind for any idea. Sustainability is recommended, but only viable in a longer term than by 2050. Therefore, one needs to exclude a global implementation of the principles of sustainable development in food scenarios. One may only assume the performance of partial actions, e.g. reducing the emission of greenhouse gases from agriculture, increasing the efficiency of using nitrogen and other fertilisers, and better water management.

3. Changes in Demand for Food

The basic factor determining food consumption is population. It is usually estimated that by 2050, the human population will have increased by at least two billion people, reaching over 9.5 billion (United Nations, 2013b). However, in the analyses concerning food security, one should not take into account the average version of UN forecasts, but rather the most extensive one, as the issue of security should concern all people living on Earth in the mid-century. Of course, the average version is much more probable than the high one, but such policy will relieve us from the duty to take care of an additional 1.3 billion people. It is more adequate to assume – according to Table 1 – that in 2050, the planet will have to feed almost 11 billion people (United Nations, 2013b). Taking into account the changes that occurred between the recent and the previous studies on population, i.e. increasing the growth forecasts, adopting the maximum option seems justified. Such change means that the number of consumers will increase by half. It does not mean that food consumption will automatically increase proportionally.

According to Table 1, by 2050, the highest percentage-based growth in the number of people will have occurred in Africa, with its population more than

[2] It is worth noting that in the course of evolution, societies whose basic food was rice, developed a different set of properties (e.g. higher tendency for cooperation) than those whose basic food were other types of grain, e.g. wheat. The latter are characterised by greater individualism

Table 1. Prospects for changes in population – High Variant (in thous.)

	Year				
	2000	**2010**	**2030**	**2050**	**2100**
World	**6 127 700**	**6 916 183**	**8 881 519**	**10 868 444**	**16 641 244**
More developed regions	1 193 355	1 240 935	1 358 551	1 470 258	1 959 544
Less developed regions	4 934 346	5 675 249	7 522 968	9 398 185	14 681 700
Africa	808 304	1 031 084	1 714 697	2 685 586	6 007 405
South America	348 246	394 021	495 453	582 729	773 125
North America	315 417	346 501	423 688	500 480	753 838
Asia	3 717 372	4 165 440	5 160 390	5 911 979	7 558 007
Europe	729 105	740 308	773 625	804 400	1 005 317

Source: Own calculations based on United Nations, Department of Economic and Social Affairs, Population Division (2013), *World Population Prospects*, New York, http://esa.un.org/wpp/unpp/p2k0data.asp [access: 19.11 .2013].

doubling, increasing by about 1.65 billion. In absolute values, the highest growth will still concern Asia, with its estimated population growth by 1.75 billion. Because of the already large number of people living on this continent, the change will not be as perceptible as in Africa. In other regions, particularly in highly-developed countries, changes in the population will be minor.

The huge growth in the number of people in Africa and Asia may lead to a delusion that this factor will be less significant than if it would have happened in developed areas, as in poor countries, the level of food consumption is low anyway. The economic changes occurring in the world allow us to expect that both Asia and Africa will maintain the high rate of economic growth, enabling them to considerably increase the level of their wealth (Prandecki, 2013). In East Asia, the process has been observed for a long time. Its scale is so vast that the first decade of the 21st century is often referred to as the domination of BRICS. It is true that the "club" only includes two Asian countries (China and India), but they have been the driving force of the whole group. Moreover, for the last few years, there have been a rapid growth slowdown in Brazil ("Has Brazil blown it?", 2013), which further proves the leading role of Asian countries in the transformations of developing economies. Consequently, it is estimated that in 2030, over 3.2 billion Asians will have constituted a great majority of the global middle class (defined as people earning or spending between 10 and 100 USD daily, calculated according to the purchasing power of 2005). They will have accounted for about 70% of consumption expenditure of the world (Brookings Institution, 2012). W. Hutchings has estimated that in the years 2010-2025, the world will generate 500,000 of new millionaires (in USD), of which number, about 200,000 will be Chinese, and India will come second in terms of the growth rate (O'Neill, 2012). The importance of the Chinese economy for future consumption may also be supported by the fact

that one of the five priorities of the current five-year development strategy is the creation of internal consumption.

The rapid economic growth (by over a dozen percent) of a few African countries is only a prelude to the development of the whole continent. Research suggests that it may only happen over a longer period (Michailof, 2013), meaning that Africa will only start playing a bigger part in consumption processes after 2030. This may slightly reduce the high proportion of Asians in the middle class in favour of the Africans. The trend is also emphasised by Citibank specialists who have predicted (on the basis of self-developed Global Growth Generators – 3G) that in 2010-2050, Africa would be characterised by the highest GDP growth rate – about 7% per year (Buiter & Rahbar, 2011). Such a fast rate is to be driven by similar factors currently observed in East Asia, so it should be assumed that in the first stage, it will be mostly export-oriented production of labour-consuming and low-processed goods (raw materials, food), and as social wealth increases, it will generate internal demand (as it is observed today in emerging economies). Therefore, it is expected that only after 2030 will the African consumption be of global significance. Such a leap may only occur if African countries overcome the basic barriers to growth, i.e. inefficient infrastructure and institutional weaknesses. The latter factor leads to difficulties in access to financing, corruption, inefficient administration and excessive tax policies (Lubowski, 2013).

Changes in the scope of economic growth and consumption may even differ considerably from actual achievements. It results from different methodologies and tools of economic change estimation. Regardless of the specific results, analysts stress the permanence of the trend, i.e. developing countries' "catching up" on wealth. It has clearly been illustrated in Figure 1, indicating that the GDP of developing countries is not only higher than in highly-developed countries, but also exceeds the global average. The trend should be viewed as permanent. As poor countries become richer, the differences in growth rates will decrease, but the general trend should not change (OECD, 2012).

In consequence of this process, the demand for food will increase rapidly. The surge will be much higher than it could be expected from the population growth, as societies becoming richer will want to consume more. Thus it is estimated that the demand for food will grow by at least 70% (FAO, 2006, 2009b). These estimates are based not only on the above assumptions concerning economic changes, but also on dietary models. It means that the scenario considers not only the issue of increased population, but also the increased demand for calories, assuming that the average daily demand will reach 3130 calories per person. The scenario assumes that in 2050, 4% of the population will still be underfed (Bruinsma, 2009). However, one should bear in mind that these forecasts were based on the assumption of the population staying under 9 billion.

The population growth will be non-uniform, meaning that the growth in food supply will have to occur primarily in developing countries that are already suffering from the instability of supplies and limitations in access to food resulting from low farming quality and lack of funds. Moreover, the problem will be more

important in highly-populated countries that, due to their human potential, have a greater growth capacity on the one hand, and need to struggle with greater challenges related to food provision on the other.

In these regions, like in the 1990s, in post-socialist countries and nowadays in rapidly developing countries, the demand for meat and fast food will grow much faster than the demand for high-quality food products. It means that the production of food meeting these expectations will require a higher supply of water, land and power than in the case of cereal growing.

4. Food Supply Trends

The above-mentioned examples show that the demand for food is rising. In consequence, there appears a question about the possibility of meeting this demand. The discussion of this issue is determined by a number of factors. Environmental factors are a priority in this respect. First of all, they include access to land of proper quality (with limited erosion) and access to water. The latter factor is strongly linked to climate changes. Furthermore, one needs to pay attention to problems of biodiversity and the circulation of elements in the environment. Each of the said factors may cause the emergence of limits to growth. Their existence in agriculture was already identified by T. Malthus at the turn of the 18th and 19th century.

If the demand for food increases continuously, and the land-area expansion capacity and productivity are limited (the formed is actually even reduced due to the rapid growth of biofuel production), the belief in the inevitability of encountering the limits to growth, also in agriculture, is very much justified. It is evident, for instance, in the drop in global food reserve that fell from 107 to 74 days over the period 2002-2011 (Brown, 2012). In the case of large urban agglomerations, the reserve is even lower.

The forecasts on food productivity are inconsistent. On the one hand, they claim that the expected consumption growth will not only be satisfied, but that the amount of calories per person will increase from 2770 in 2005 to approx. 3100 in 2050 (Bruinsma, 2009; FAO, 2009a). On the other hand, there are many studies indicating barriers to reaching that goal (Nellemann et al., 2009; Jaegerskog and Joench Clausen, 2012; Conway, 2012). The 2008 crisis has proved that scenarios need not be far from reality. In particular, they concern the limited possibilities of obtaining new land for farming, limitations to technology-assisted growing and breeding, an most of all – problems with limited access to water ("Global food crisis looms as climate change and population growth strip fertile land", 2007).

The latter issue definitely needs most attention. Water circulation disruptions result from climate changes. Despite many sceptical opinions, it should be assumed that climate warming is taking place and will be progressing. Various methods of measurement produce different results regarding the scale and possible

consequences, and the uncertainty areas are diversely interpreted (Enserink et al, 2013), but the trend remains unchanged. The causes of the phenomenon, and especially the anthropogenic responsibility for its intensification, are of secondary significance.

Regardless of the efforts made, it should be assumed that in the studied period, the temperature rise cannot be stopped. It results from the progress being made in developing countries, accompanied by increased emission of greenhouse gases and a certain inertia of climate processes, which means that even if the concentration of greenhouse gases in the atmosphere is stabilised, the temperature will keep increasing anyway for some time. It is corroborated by the latest IPCC report (2013) that predicts that around 2050, the average temperature on Earth will have risen by 1-2.5 degrees Celsius, while later on, the changes may accelerate considerably. The recent UNEP report (2013) provides information that the gap between the actual emission of greenhouse gases and the political assumptions is increasing, which suggests that higher temperature growths are more probable than careful, minimum estimates.

Moreover, it should be noted that even the attainment of the pursued goals, i.e. halting climate changes at the level of two degrees Celsius higher around 2050 will have significant consequences for agriculture. Therefore, the agriculture sector should be the first to take action to adopt to the changes and possibly prevent further ones (Serrao-Neumann et al., 2013).

Higher CO2 concentration in the atmosphere triggers greater growth and acceleration of vegetative processes. However, it is not only connected with increased harvest, but mostly with earlier and more intensive growth of leaves and an extended blossoming period. Observations show that if the temperature rises by 1 degree, there is a 4 or 5 times more intensive growth of leaves and flowers. These processes result in greater demand for water (Wolkovich et al., 2012) and heightened insect activity. The latter process entails both positive effects, such as increased pollination, and negative ones, e.g. faster spread of diseases.

However, temperature rise also has other consequences. In the case of crops, it usually reduces productivity. The scale of such reduction is hard to calculate, as estimates in this area differ significantly depending on the species and research methodology. It is estimated that a 1-degree temperature rise results in an approx. 10-percent drop in rice harvesting – one of the basic global food products (IPCC, 2007a). All in all, it is assumed that the combination of these effects will not affect production effectiveness or will reduce it slightly (Randers, 2012).

What is more, climate changes usually induce an earlier occurrence of spring. Estimates show that on the northern hemisphere, the advancing ranges from 2.3 (Parmesan & Yohe, 2003) to 5.5 day per decade (Root et al., 2003), meaning that if this rate progresses this way, the vegetation period in 2050 will start at least half a month earlier. In consequence of this shift, there arises a time gap between the activity of predators and their prey. It reduces the biodiversity of ecosystems and deteriorates food production conditions (Thackeray et al., 2010). For example,

the plankton grows faster, forestalling the migration of animals feeding on it. In effect, there first appears an excess of plankton, followed by its later shortage in the fish feeding period, resulting in its reduced population and scarcity of fish as food for humans.

The above-described circumstances will significantly affect food production, but a much graver risk is connected with access to water. The problem is already acutely experienced in various regions of the Earth (Chartres and Varma 2010). In 2009, 2.8 billion people suffered from water shortages. By 2030, they may extend to even 3.9 billion (Lean, 2009). The issue was summarised very distinctly during the Global Water Forum held in October 2013, by UN Secretary General who said that the problem will concern half of the entire population (RT, 2013), which means that taking into account the climate warming trends, the situation will aggravate severely by 2050. Its scale was presented in IPCC reports (2007b, 2013). The temperature rise will make changes in local hydrologic cycles, resulting in insufficient or excessive precipitation, as well as melting of the icecap which is the main drinking water resource for vast regions of the world. This factor and the pollution of available supplies are making water an increasingly valuable good. This matter is one of the larger global challenges.

With reference to agriculture, not only the questions of access to water and soil humidity are of importance, but also the precipitation volume. In the former case, one can already notice a drop in water availability in areas of intensive farming. In the future, the problem will be more severe in Europe, where the effects of changes will be most visible. The problems will also affect the South of the USA and South America, mostly Brazil. In areas already suffering from water deficit, changes will not be as significant, but the situation will deteriorate in most cases. One exception from this rule may be the African Sahelu area. Observations have shown that contrary to typical trends, humidity in this dry area grows as the temperature rises, creating a tropical climate, favouring agriculture (Tierney & de Menocal, 2013). As far as precipitation is concerned, a similar situation is expected, i.e. the biggest changes will occur in the southern part of Europe, while in the northern and central parts of the continent, the amount of precipitation will increase. The phenomenon will intensify eastward, which means that the most severe changes will be recorded in Siberia. A considerable increase of precipitation is also expected in Canada (IPCC, 2013).

Other factors connected with climate changes and access to water are land erosion and salinity. If the temperature rises, and the soil humidity drops, the two above-mentioned processes occur much faster. It also increases the risk of fires resulting in agricultural losses.

Climate changes will raise the demand for irrigation systems that will be used in many regions of the world where they were hitherto not necessary. Moreover, there will be a shift in global agriculture centres. It is assumed that with an adequate economic policy, countries of the North, particularly Russia and Canada, will become the world's food reserve base. In the case of Canada, it may even make this country a superpower (Smith, 2010). The countries of Central and

Northern Europe may also play an important part, provided that they ensure proper systems of water retention and field irrigation.

Apart from a physical lack of water, there may occur technical and financial problems connected with its extraction, transport and distribution. Such deficit is referred to as economic water poverty (Parliamentary Office of Science and Technology, 2002), but its effects are as acute as a physical absence of resources. Challenges connected with access to water will be so significant they will have global consequences. Their scale is hard to predict. The mildest ones include the migration of entire nations. The most drastic solutions include armed conflicts (NIC, 2008; Wezer, 2010). It is commonly believed that limitations in water acquisition will be the farthest-reaching consequences of climate warming (Stern, 2006). However, most scenarios concerning agricultural development only consider its direct effects, i.e. decreased production capacity, while completely omitting the losses resulting from social aspects of this issue, e.g. the influence of wars on farming productivity.

Climatic changes make it hard to expect an expansion of the land area fit for agricultural use. On the one hand, there will occur the aforementioned soil desiccation and erosion in traditionally agricultural areas, and on the other, new terrains will become available for farming, where previous climate conditions prevented such activity. Also, as the climate becomes warmer, there will be a growing pressure to counteract the deforestation of further areas. An additional obstacle will arise after a part of the arable areas will be used for growing plants for the production of biofuels. This initiative lacks a rational basis, which resulted in reduced enthusiasm about this source of primary energy in the EU, but due to marketing reasons and financial benefits, in many regions of the world there still is a high interest in this form of acquisition of energy and heat. As a result, it is estimated that biofuels will most severely affect the expansion of agriculture in developing countries, particularly in Subsaharan Africa, Latin America and the Caribbean. It should be assumed that in 2050, the area of land used for food production will be slightly smaller than today. In most drastic cases, by mid-century, the drop in food supply resulting from biofuel production may reach 8% (Rosegrant et al., 2008).

As J. Randers (2012) correctly noted, the problem of biofuels should not constitute the basic dilemma in connection with food production, as the profitability of biofuel production depends on the price of petroleum. If its price goes down, biofuels will not be attractive, as their production will be unprofitable. On the other hand, if biofuel production becomes more popular, food process will go up, thus triggering interest in the cultivation of edible plants. This way, the market itself will regulate the demand for specific products. Of course, the system may be disrupted, e.g. due to relevant international regulations, countries will be interested in growing a certain amount of biofuel crops, and to achieve the desired indicators, they will offer subsidies to encourage the production. However, it still seems that it will not be of great significance.

In the analysis of food supply, one also needs to mention marine resources. Climate changes may severely affect fishing, as many migratory fish species will encounter difficulties resulting from ecosystem transformations. Moreover, it is already acknowledged today that wasteful sea exploitation has led to the overfishing of many fisheries, so deficits in fish availability need not be caused by climate changes. Therefore, the basic diet will be dominated by breeding species, while wild fish will become a synonym of luxury (Randers, 2012).

Water basins are still rich ecosystems that may easily feed humans. In this respect, one may point to the scarcely-used abundance of edible water plants and algae that, next to insects, might become the basic source of calories not only for Asians, but also for people on other continents, including the Westerners (Pauli, 2010). Such an innovative approach is still far from traditional agricultural thinking, but is an important safety exit enabling the survival of mankind, even in the face of a dramatic drop in the production of standard foods. It appears that in 2050, a common use of these resources will not be necessary or popular due to the present consumption habits of societies.

Considering the limited possibilities of acquiring new arable land and the uncertainty connected with climate changes, the only solutions increasing the supply of food may be of technological nature. Here, priority goes to genetics and genetically modified organisms that are able to quickly boost the efficiency of farming and accelerate the growth of animals. Genetic modifications may be introduced in two ways: in laboratories, employing the latest technologies, or by cross-breeding adequate species. In both cases, it is possible to achieve spectacular success, exemplified by the "golden rice" (fruit of pure genetics) and the Mexican wheat (grown naturally by Norman Borlaug). The use of these products has saved millions of lives. However, the latter path of technological modifications is more socially acceptable.

Technological modifications concern not only the development of new kinds of plants and animals, and the improvement of the existing ones, but also the implementation of more efficient growing, harvesting and breeding processes. In highly-developed countries, the majority of food is wasted in the final links of the sales chain, i.e. in stores and directly by customers. Developing countries are still struggling with the issue of efficient harvesting of crops and their industrial-scale storage, e.g. in proper cold rooms. Reducing the scale of this problem may produce much greater success than many technologies designed to increase the productivity of farming and breeding.

Some authors estimate that technological modifications offer a fundamental solution to the food problem, as they would enable the recovery of losses caused by climate changes and ensure food for an additional billions people. This particularly concerns Europe (Ewert et al., 2005). One might recall that in consequence of technological progress, the harvest index of many cereal species has improved considerably, but observations show that the amount of available grains per capita is constantly shrinking. This makes an impression that technology

is not able to ensure a food supply growth rate proportional to population growth (Pimentel & Pimentel, 2008). In practice, such impression is deceptive, as the number of calories per person rises simultaneously with population growth. It results from the changes in consumption models, i.e. an increased consumption of non-wheat foods, mostly meat and fish.

A problem connected with technology is the consumption of energy. It is necessary for agriculture, but its use is also an important contribution in the development of crop-increasing fertilisers, as well as pest-control preparations. It is expected that the crucial technological changes in agriculture will be brought about by solutions that enable simultaneous reduction of energy consumption and increase of productivity. Operations aimed at reducing the demand for certain resources, such as nitrogen, are of similar importance. It is assumed that significant achievements in this area may occur in 20-30 years. However, there are currently no grounds to believe that technologies will help reduce water consumption by 2050. Therefore, the questions of water availability should be regarded as the fundamental challenge of agriculture in this time perspective.

5. Social Aspects of Civilisation Changes and Food Problems

Basic discussions on the possibilities of feeding mankind are usually limited to problems with technical barriers to achieving sufficient production capacity.

Analyses focus on such issues as demand for food, productivity (both in absolute and calorific values), production technologies, etc. Such approach, as said before, seems to fit perfectly within the problem of limits to growth. However, it is worth to mention that the key element of the food issue is the market. In the last 30 years, there have occurred both population growth and a 17% increase of the number of calories per person. Moreover, the value of this rise is much higher than the needs of all human kind (Harkness, 2011). The number of people struggling for access to food is constantly dropping. According to FAO estimates, in 2011-2013, the shortage of calories was suffered by 842 million people, which is a reduction in comparison to previous studies from the 2010-2012 period, when the number was determined at 868 million. The trend has been visible for a long time, as when compared to the early 1990s, the amount of underfed people has fallen by 17% The rate of this trend is fast enough to attain the Millennium Development Goals (MDG) in food availability in the 2000-2015 period (thus halving the share of people suffering from hunger in the population – from 23.2% to 11.6%). Considering a simultaneous population growth, it means that the number of starving people will be reduced by 150 million, corresponding to 15% of the total population (United Nations, 2013a). It is definitely not enough to reach the goals of the World Food Summit of 1996, namely, to reduce the problem by half (FAO, 2013).

Continuation of this trend gives hope for further reduction of malnutrition, but no simple evaluation of the trend is possible. It stems from the population

growth trends and climate change forecasts. Both factors overlap, meaning that the number of people will grow mainly in areas currently regarded as poor, and frequently having rather unoptimistic developmental prospects. Although the latter situation has significantly improved in comparison to the previous decades. In addition, these countries are already struggling with numerous problems connected with food availability. They mostly arise from difficult climate conditions and obsolete agricultural technologies. In view of the predicted intensification of climate change processes, it should be expected that in most cases, the possibilities of food acquisition in these areas will deteriorate, resulting in rising food prices and increasing economic exclusion. Poor farmers experiencing difficulties with access to small capital will not (and often they already cannot) afford crisis insurance which are necessary for recreating farm production capacities, and neither will they obtain funds for implementing technological modifications requiring the purchase of expensive equipment. It should be emphasised that not all processes of adjusting to climate changes require high expenditure. Some of them, as the use of aftercrops, only rely on knowledge, but financial limitations often constitute a fundamental barrier to the development of education in rural areas.

The above-presented climate change processes suggest that countries classified as highly-developed will also be threatened by the negative effects of temperature rise. It will be particularly noticeable in the Mediterranean region. However, their wealth and globalisation will enable them to implement expensive adjustment processes and possible import of food. What is more, many highly-developed countries may become the main global food exporters. It will further obstruct access to food in developing countries because of higher food prices. Therefore, it is estimated that in mid-century, the share of underfed people may be similar to the current one, ranging from 10% to 20%. In absolute values, it should be interpreted as doubling or tripling the number of people facing this problem.

The data provided above show that from the technical point of view, feeding the entire human population in 2050 will be possible. A real problem is encountered when it comes to food distribution (Paillard et al., 2011). In highly--developed countries, food is relatively cheap, encouraging people to consume much more of it. In consequence, the problem of obesity dramatically increases. According to FAO reports, the global costs of health threats resulting from excess of consumed food are as serious as the ones caused by malnutrition, reaching about 1.4 trillion USD in both cases (corresponding to around 2% of the global GDP). It is estimated that the problem of malnutrition concerns about 868 million people (12.5% of the population). On the other hand, over 1.4 billion people are suffering from excessive weight, including 500 million from obesity, or pathological overweight (FAO, 2013). Paradoxically, the problem of obesity is also connected with regions of malnutrition. It frequently happens that children of parents struggling with problems with access to food are overfed after the problems end, in

order to ensure their safe growth. It is estimated that the situation concerns about 7% of children under the age of five. A quarter of them live in Subsaharan Africa (United Nations, 2013a). Forecasts about the increased daily ration of calories per person suggest that in the future, one should expect an aggravation of problems with obesity, considerably affecting the quality of life. Already nowadays attention is brought to the fact that in many countries, e.g. in the USA and the European countries, the current generation of children may live shorter than their parents, due to improper diet.

Another important challenge concerning food is its wasting. The problem may occur both in the process of production, and consumption. The latter issue is particularly alarming. FAO estimates show that food wasting is connected with wealth. The more developed a country is, the higher the inefficiency. In the case of highly-developed countries (Europe and North America), annual losses amount to 280-300 kg per person, of which 95-115 kg is wasted by the consumer (about 40% of consumption). This gives a total of 222 million tons, which is comparable to the entire production of Subsaharan Africa. In poor regions, like the said Subsaharan Africa and Southeast Asia, a consumer wastes only 9-11 kg of food in a year. The wasting problem is caused not just by incorrect household management, but also by a low quality of food. Because of this, the agreeable periods of food storage, especially in somewhat substandard conditions, have shortened dramatically.

Social problems related to food production also include living standards. Obviously, they are much better in cities than in rural areas. Even decades of EU policy have not managed to change this tendency (though they have improved it considerably). This situation has led to the migration of people from villages to urban areas. The trend mostly concerns dynamic and innovative individuals who are not afraid of challenges and are ready to face difficulties and uncertainty. Consequently, people who stay in the country are those representing more conservative behaviour. This hampers the introduction of new technologies and changes resulting from the necessity to adapt to new circumstances, as in many communities it is hard to find leaders willing to take up the challenge. It is not just a matter of controversial solutions entailing the risk of failure, but even changes that are recognised in the world but unknown in a given region. As a result, the introduction of modern solutions regarding resource use efficiency and improvement of productivity encounters a barrier of conservative attitude. Due to a slow rate of social changes and the outflow of the most active individuals from rural areas, the trend may aggravate further. One has to bear in mind that the tempo of global changes is increasing. It also concerns technological changes in agriculture, including the employment of the latest technologies for optimum proportioning of water and fertilisers.

A question that becomes vital is how to keep young and active people in the country in order to optimise the use of land for food production? Already today, the problem of aging farmers has become a global issue. Young people treat living in the country as a last resort, only when all other possibilities of development fail.

Furthermore, one needs to think of a way to convince the young to make decisions based on long-term analysis, i.e. to take action aimed at avoiding the limits to growth similar to climate problems. It seems necessary not only from the point of view of individuals, but also entire generations and their families (Barbieri Masini, 2013). Will young people be interested in staying in the country and working in agriculture if they do not have easy access to basic tools used by their peers living in cities, such as the Internet and social media? How to persuade active young people that hard work in farming may be just as attractive as a few times better-paid jobs in production, not requiring such responsibility and attachment to the farm? It seems possible, as it is not always the money that wins, but it is important to believe that work in agriculture can be modern and based on cutting-edge technologies. It does not guarantee that the process of farmers aging as a social group is stopped, but it does give hope that it can be slowed down.

Against this background, there emerges another future dilemma, namely, the shape of agriculture. In most cases, modern technologies increase the economies of scale and introduce an intensive monocultural model of agriculture. It is more profitable due to the distribution of costs and difficulties with estimating external effects in farming. However, this global trend leads to the destruction of traditional, family-ran farms that had been the foundations of many societies, providing the basis for the upkeep of entire multigenerational families. The concentration of land and increasing competitiveness further impoverish the smallest farms, depriving them of access to the market.

These considerations lead to the conclusion that the fundamental factors determining the global alimentary situation are economic, social and political issues. The anticipated climate changes will make food production in densely-populated areas insufficient, imposing a global trade of food products. It should be expected that the progressing regional integration processes will eventually abolish customs barriers in the world economy. The only exception from this rule will be the emergence of permanent, global shortages in food supply, but in view of the presented analyses, such probability is minor.

6. Conclusion

It is hard to predict the future in the perspective of forty years. Taking into account the multiplicity of aspects that should be discussed, one is unable to develop precise quantitative analyses. They may only be used as a tool illustrating the most probable trends. This way, the holistic assessment of the food problem in the mid-21st century should be based primarily on qualitative evaluations indicating possible threats and possibilities of their neutralisation.

Estimates show that the demand for food will rise, resulting from the expected population growth, malnutrition combating and the increasing demand for calories in human diet. In consideration of these factors and the rapid economic

growth in developing countries, it should be assumed that the demand for food will surge by at least 70%, probably it will double.

Numerous analyses suggest that from the point of view of technology, ensuring such a huge amount of food is only determined by natural conditions, i.e. access to water. This factor will be of key importance to further development of agriculture. Forecasts concerning climate changes support the belief that the process of climate warming is an inevitable process, and only the scale and consequences of this phenomenon may be imprecisely estimated. This entails global consequences regarding food production, i.e. the shifting of the main production areas towards the poles. It mostly concerns the northern hemisphere, where climate warming will open new possibilities for farming in Canada, Russia and the Scandinavian countries.

Therefore, it seems that the key to safeguarding global food security lies in socio-political relations. The increased demand for food will mostly appear in the "Poor South". With the simultaneous rise of supply in the north, it forms new poles of international trade. The situation makes the globalisation of farm product trade and further elimination of barriers the basic prerequisites for ensuring global alimentary balance. Assuming that the low purchasing power of the South will improve gradually over the next 40 years, the freedom of trade will provide a sufficient solution in many densely-populated areas (e.g. China, India, Indonesia, Nigeria). In the case of countries without strong development prospects, one should consider empathy-based initiatives, such as "work for food" programmes, making food a form of support for the poorest societies. However, as there is no real possibility of establishing a global institution holding adequate executive power in this respect, one should view such initiatives as utopias. Thus, it should be assumed that by 2050, the percentage of the population suffering from malnutrition may again rise to about 20%, corresponding to 1.5 to 2.5 billion people, depending on the total world population. Reaching such a high number will mark a failure of mankind's idea of humanitarianism.

One way of combating such trends is a holistic approach to the food issue, i.e. not just the analysis of food supply questions, but also of the circumstances of the operation of entire rural-area ecosystems, where the quality of human life will be as much important as the problems of environmental protection and food supply. The first notable expression of such a sustainable approach to the subject was the Global Landscapes Forum, a conference accompanying COP19 in Warsaw, when persons responsible for agriculture and forestry started a joint debate.

In addition, it should be emphasised that the occurrence of environmental limits to growth by 2050 is quite probable. However, contrary to the visions frequently presented in the literature, it will not cause an abrupt, immediate disaster, but only impede economic growth (with its rate determined by the type of limit). Assuming that globalisation processes and open trade are continued, they will further increase the gap between the rich and the poor, as the market will raise the prices of rare commodities only affordable by the wealthy. Consequently, in highly-developed countries, the crisis symptoms will be visible much later than

in developing ones. Ensuring access to food is a primary necessity. Therefore, if limits are encountered (such as rising prices of fuel), the increasing costs of food will reduce the purchasing of other consumer goods and transform the structure of food purchasing, i.e. high-quality products will be replaced by less expensive substitutes of lower quality.

However, in view of the anticipated growth of wealth in developing countries, it is more probable that the demand for quality products, typically bought by the middle class, will actually go up. The trend is derived from the proportion of food costs in the budget of individuals. People often buy larger amounts of food that – for various reasons – become unfit for consumption and are being thrown away.

Taking into consideration the above arguments, one should take note that the global rationality in the field of food acquisition should be more based on the issues of distribution and the employment of adequate policies, than on the production capacity itself. By implementing relevant programmes connected with distribution and limiting food wasting, it is possible to achieve much higher efficiency of using the existing resources (and thus feeding a larger number of people) without the need to transform food production. Technological improvements promoting the increase of productivity should be treated as supplementary to the primary approach.

Bibliography

ADB. (2011). *Asia 2050: Realizing the Asian Century Executive Summary*. Asian Development Bank.

Barbieri Masini, E. (2013). Intergenerational responsibility and education for the future. *Futures*, (45), 532–537.

Brookings Institution. (2012). *Middle Class Measures. Development, Aid and Governance Indicators*. Washington D.C.: Brookings Institution.

Brown, L. R. (2012). *Full planet, empty plates: the new geopolitics of food scarcity*. New York, London: W. W. Norton & Company.

Bruinsma, J. (2009). The Resource Outlook to 2050. Presented at: How to Feed the World in 2050, Rome: Food and Agriculture Organization of the United Nations.

Brunet, A., & Guichard, J.-P. (2011). *Chiny światowym hegemonem? Imperializm ekonomiczny Państwa Środka*. Warszawa: Wydawnictwo Studio Emka.

Buiter, W., & Rahbar, E. (2011). *Global Growth Generators Moving beyond 'Emerging Markets' and 'BRIC'* (Global Economics View). Citigroup Global Markets. Accessed from http://www.investphilippines.info/arangkada/wp-content/uploads/2011/07/Citi-Global-Growth-Generators.pdf

Chartres, C. J., & Varma, S. (2010). *Out of water: from abundance to scarcity and how to solve the world's water problems*. Upper Saddle River, N.J.; London: Financial Times/Prentice Hall; Pearson Education.

Conway, G. (2012). *One billion hungry: can we feed the world?*. Ithaca: Comstock publishing associates.

Enserink, B., Kwakkel, J. H., & Veenman, S. (2013). Coping with uncertainty in climate policy making: (Mis)understanding scenario studies. *Futures*, (53), 1–12.

Ewert, F., Rounsevell, M. D. A., Reginster, I., Metzger, M. J., & Leemans, R. (2005). Future scenarios of European agricultural land use I. Estimating changes in crop productivity. *Agriculture, Ecosystems & Environment*, (107), 101–116.

FAO. (2006). *World agriculture towards 2030/2050: Interim report*. Food and Agriculture Organization of the United Nations. Accessed from www.fao.org/fileadmin/templates/em2009/docs/FAO_2006_.pdf

FAO. (2009a). Global agriculture towards 2050. Presented at: How to feed the World in 2050: High-level expert forum, Rome: Food and Agriculture Organization of the United Nations. Accessed from http://www.fao.org/fileadmin/templates/wsfs/docs/Issues_papers/HLEF2050_Global_Agriculture.pdf

FAO. (2009b). How to feed the World in 2050.Presented at: How to feed the World in 2050: High-level expert forum, Rome: Food and Agriculture Organization of the United Nations. Accessed from www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050. pdf

FAO. (2013). *The State of Food and Agriculture 2013*. Rome: Food and Agriculture Organization of The United Nations.

GH. (2013). *Global Agricultural Productivity Report 2013. Sustainable Pathways to Sufficient Nutritious and Affordable Food*. Global Harvest Initiative.

Global food crisis looms as climate change and population growth strip fertile land. (2007, August 31). *The Guardian*.

Goldstein, A. (2013). China's Real and Present Danger. *Foreign Affairs*. Accessed from http://www.foreignaffairs.com/articles/139651/avery-goldstein/chinas-real-and-present-danger

Harkness, J. (2011). The 2050 challenge to our global food system. Institute for Agriculture and Trade Policy. Accessed from http://www.iatp.org/documents/the-2050-challenge-to-our-global-food-system

Has Brazil blown it? (2013, September 28). *The Economist*. Accessed from http://www.economist.com/news/leaders/21586833-stagnant-economy-bloated-state-and-mass-protests-mean-dilma-rousseff-must-change-course-has?spc=scode&spv=xm&ah=9d7f7ab945510a56fa6d37c30b6f1709

IAASTD. (2009). *Agriculture at a Crossroad*. Washington D.C.: International Assessment of Agricultural Knowledge.

IPCC. (2007a). *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Cambridge: Intergovernmental Panel on Climate Change.

IPCC. (2007b). *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Cambridge: Intergovernmental Panel on Climate Change.

IPCC. (2013). *Climate Change 2013: The Physical Science Basis Working Group I contribution to the IPCC 5th Assessment Report*. Stockholm: Intergovernmental Panel on Climate Change.

Jaegerskog, A., & Joench Clausen, T. (2012). *Feeding a Thirsty World – Challenges and Opportunities for Water and Food Secure Future* (No. Report Nr. 31). Stockholm: SIWI.

Lean, G. (2009, March 15). Water scarcity now bigger threat than financial crisis. *The Independent*.

Lubowski, A. (2013). *Świat 2040. Czy Zachód musi przegrać?* Kraków: Wydawnictwo Znak.

MA. (2005). *Ecosystems and Human Well-being: Scenarios*. Washington D.C.: Millenium Ecosystem Assesment.

Michailof, S. (2013). Africa 2050: Jobs and Prosperity in a Multipolar Global Economy – Moving Out of Fragility and Conflict. *Global Journal of Emerging Market Economies*, *5*(2), 117–149. doi: 10.1177/0974910113494537

Nellemann, C., MacDevette, M., Manders, T., Eickhout, B., Svihus, B., Prins, A. G., & Kaltenborn, B. P. (Red.). (2009). *The environmental food crisis – The environment's role in overrunning future food crises*. United Nations Environment Programme, GRID-Arendal.

NIC. (2008). *Global Trends 2025. A Transformed World*. Washington: National Intelligence Council.

O'Neill, J. (2012). *The growth map. Economic opportunity in the BRICs and beyond*. New York: Portfolio Hardcover/Penguin Group.

OECD. (2012). *Looking to 2060: A Global Vision of Long-Term Growth* (No. 15). Paris.

Paillard, S., Dorin, B., Le Cotty, T., Ronzon, T., & Treyer, S. (2011). *Food Security by 2050: Insights from the Agrimonde Project* (Foresight exercise No. 196). Vienna: European Foresight Platform.

Parliamentary Office of Science and Technology. (2002). *Access to Water in Developing Countries* (No. Postnote No 178). London.

Parmesan, C., & Yohe, G. (2003). A globally coherent fingerprint of climate change impacts across natural systems. *Nature*, (421), 37–42.

Pauli, G. A. (2010). *The blue economy 10 years, 100 innovations, 100 million jobs*. Taos: Paradigm Publications.

Pimentel, D., & Pimentel, M. C. (2008). *Food, Energy, and Society* (third.). Boca Raton: CRC PressTaylor and Francis Group.

Prandecki, K. (2013). Zmiany w globalnym układzie sił gospodarczych w świecie. W.K. Rybiński (ed.), *Polska w niestabilnej gospodarce europejskiej i globalnej. Problemy polityki gospodarczej i rozwoju*. Akademia Finansów i Biznesu Vistula.

Prandecki, K., Nawrot, K. A., & Wawrzyński, M. (2013). Nowe centrum i nowe peryferia połowy XXI wieku. *Przyszłość Świat-Europa-Polska*, 28(2), 58–81.

Randers, J. (2012). *2052 A Global Forecast for the Next Forty Years*. White River Junction, Vt: Chelsa Green Publishing.

Root, T. L., Price, J. T., Hall, K. R., Schneider, S. H., Rosenzweig, C., & Pounds, J. A. (2003). Fingerprints of global warming on wild animals and plants. *Nature*, (421), 57–60.

Rosegrant, M. W., Ewing, M., Msangi, S., & Zhu, T. (2008). *Bioenergy and Global Food Situation until 2020/2050*. Berlin: WBGU. Accessed from http://www.wbgu.de/wbgu_jg2008_ex08.pdf

RT. (2013, October 8). Water scarcity by 2030: True for every second person on earth, UN says. RT News. Accessed from http://rt.com/news/water-shortage-un-population--901/

Serrao-Neumann, S., Di Giulio, G. M., Ferreira, L. C., & Low Choy, D. (2013). Climate change adaptation: Is there a role for intervention research? *Futures*, (53), 86–97.

Smith, L. C. (2010). *The world in 2050: four forces shaping civilization's northern future*. New York: Dutton.

Stern, N. (2006). *The Economics of Climate Change (The Stern Review)*. Cambridge: Cambridge University Press.

Thackeray, S. J., Sparks, T. H., Burthe, S., Bacon, P. J., Bell, J. R., Botham, M. S., … Wanless, S. (2010). Trophic level asynchrony in rates of phenological change for marine, freshwater and terrestrial environments. *Global Change Biology*, *16*(12), 3304–3313. doi:10.1111/j.1365-2486.2010.02165.x

Tierney, J. E., & de Menocal, P. B. (2013). Abrupt Shifts in Horn of Africa Hydroclimate Since the Last Glacial Maximum. *Science*, *342*(6160), 843–846.

UNEP. (2013). *The Emissions Gap Report 2013*. Nairobi: United Nations Environment Programme (UNEP).

United Nations. (2013a). *The Millennium Development Goals Report 2013*. New York: United Nations.

United Nations. (2013b). *World Population Prospects*. United Nations, Department of Economic and Social Affairs. Accessed from http://esa.un.org/wpp/unpp/p2k0data.asp

Ward, K. (2012). *The World in 2050. From the Top 30 to the Top 100*. HSBC Global Research.

Wezer, H. (2010). *Wojny klimatyczne*. Warszawa: Wydawnictwo Krytyki Politycznej.

Wolkovich, E. M., Cook, B. I., Allen, J. M., Crimmins, T. M., Betancourt, J. L., Travers, S. E., … Cleland, E. E. (2012). Warming experiments underpredict plant phenological responses to climate change. *Nature*, *485*, 494–497. doi: doi:10.1038/nature11014

ISBN 978-83-66847-29-3