

Punctuated Equilibria Paradigm and Security in the Modern World

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The modern world appears like a multipolar arena with penetrable frontiers which are becoming greater and fuzzier, one that offers an array of divergent forms of truth and feels like a melting pot of national and global interests that are in permanent harmony and conflict at the same time. Permanent competition and conflict between the interests of a few and many dominates the public space. The nature of military conflicts has likely changed. Unlike in the past, when wars were easily identifiable and limited in space and time, nowadays the commonplace of wars is not only a specific geographic region, but more often it can be cyberspace, mass media or economic systems, which all lack physical borders. Nowadays, war can be won or lost without a single drop of blood being spilled. It can be lost even without noticing it. Last but not least, vital changes appear to come into being as if out of nothing, unexpectedly and seemingly without any cause. In this paper, I propose to apply the so-called Heraclitus law and the model of punctuated equilibria to the deep archaeological past to provide models for military organizations in the present to predict future conflicts and their specific forms (Bárta 2018).

As a consequence of these complexities, modern armies around the world have significantly changed by definition and nature. In contrast to the past, it is not only a force defending a given country and geographic region. Armies have been converted into a force that has – in addition to traditional modes of acting – goals to ensure political stability and/or security in its mother’s country or counter climatic instability. To meet such challenges armies unavoidably require analytical tools which can be provided exclusively by interdisciplinary research anticipating and explicating long-term trends and major laws underlying the evolution of any given civilization. It is for this reason, that the ‘deep-time’ archaeological record of the past is so germane to planners today. One of the most important theories is punctuated equilibria theory that is based on the evidence of history from many continents and several millennia of complex civilizations existence, provides a multispectral and efficient tool for mapping long term trajectories and for predicting major periods of instability and ‘leap changes’ (originally this idea was developed for explaining fossil records, see Eldredge and Gould 1972). Thus we need big history, Deep time, and Big data to find our way into the future and make the world more stable and safer.

By definition this theory postulates that major changes take place abruptly and change entirely the nature and principles on which a given system operates. Such a ‘leap period’ is always preceded by a longer period of stasis, a seemingly uneventful stage, during which all components of the whole system (be it economic, social, administrative, symbolical, political etc.) accumulate the potential for a major change. After reaching a critical level of multiple minor changes and the increasing impact of diminishing returns of the system, the period of stasis (or equilibria) disappears and the individual subsystems start to intensify their interactions with each other, eventually leading to a deep and complex change of the overall structure and operating principles of the system (Bárta 2016).

What emerges is that we need to analyze long term tendencies and deep time data from as many spheres of human activities as possible in order to recognize and predict

the loss of equilibria and an aggravation of potential for a leap forward in the form of a major discontinuity. This being not enough, a cultural system entering such an unstable and historically brief period of major reshuffle is more often than not influenced by external factors of which climate change may be the most essential one. While the inner dynamics of a given system can be controlled to a limited extent, modified and tempered, external factors such as climate change (being the most significant one), are global variables that cannot be overridden, and consequently, have always led to political instability. Modern military organizations might consider that long term trends in study of human populations, processes in nature, and the mechanisms of their change, together with the predictive potential inherent in this theory, are precisely those that can considerably increase security and stability, but may also have significant bearing on the efficacy of performance, and accuracy of military strategies. What are these tools and how can they be used?

The scene

It can be stated with significant confidence that the phenomena of the rise, fall (collapse is used exclusively in the sense of a major loss of complexity throughout this text) and subsequent regeneration are inseparably linked to the historical development of human societies. It is, in a way, a part of the inherent code of every civilization. Anthropologists and historians refer to civilizations in different ways, however, all definitions focus on a number of traits that separate these very complex social formations from less complex bands, tribes, and chiefdoms. Early researchers such as V. Gordon Childe identified a number of 'traits' that distinguish civilizations such as complex settlement patterns, centralized subsistence and economies, social stratification literacy and more (Childe 1942). Often, the term 'archaic state' is used to contrast with modern nation-states, suggesting that archaic states were societies with (minimally) two class endogamous strata (a professional ruling class and a commoner class) and a government that was both highly centralized and internally specialized. In many respects combatants in asymmetric warfare today, that is the 'non-state' players have many of the features of archaic states (Feinman and Marcus 1998). Civilizations, societies and cultures are born, rise, culminate and transform through processes of collapse. It is beyond doubt that no civilization or society can last or proliferate indefinitely. However, a new form of a society/civilization based on the preceding one can be born and grow by the same population that moves from one complex form of a system to another one. This, of course, leads to an entirely new paradigm, new set of norms and symbolical world and domination of new elites.

In this brief paper, I would like to discuss two relatively simple observations. The first one is that significant changes in a society take the form of a sudden and profound 'leap change' that transforms the system into a new one. The second is that factors responsible for the emergence of a certain social system are usually the same as those that in the end precipitate its crisis; this is they are usually immediately followed by a phase of regeneration and a new rise. This is called the Heraclitus Law because this Greek philosopher, living in the 6th and 5th centuries BC, was one of the earliest thinkers who recognized this law. If we want to understand why a system is plunging into a crisis, it is erroneous to focus only on this stage of development. What must be done is to focus the analytical lens on the phase during which the system was at its incipient stage and was about to gain momentum. It is at this point where actors originally instigating the

rise of the system can be identified. These will later on be typically those that can be identified to navigate the system into a crisis.

The punctuated equilibria theory proposes that most social systems develop along a sustained trajectory of seemingly uneventful development (called stasis) punctuated by sudden complex changes in virtually all subsystems according to multiplier effect, which bring the system to a completely new level of organization. The Multiplier effect is a concept that describes the anatomy of the process that leads to a 'leap' change. It is operational when changes or innovations occurring in one sphere of human activity (in one subsystem be it economic, political, administrative, political, symbolical, legal one or some others) act so as to instigate changes in other subsystems. These accumulated changes in one or more spheres act so as to enhance further changes in the first sphere. This mechanism leads to intensive multiple interactions among all components of the system. The result is profound and structurally all-spheres encompassing transformation of the system (Renfrew 1972). When the sustained periods between individual punctures/leap events disappear or become shorter and shorter, we may predict a major crisis and a huge loss of complexity coming (in other words, there is an imminent danger of the collapse of a given society).

This inner dynamics proces is often coupled with parallel external dynamics represented by the non-linear development of environment. It is certainly interesting to see that roughly evenly distributed major changes in climatic processes taking place once in about 1,000 years (observed by climatologist Gerald Bond hence referred to as the 'Bond events') had severe bearing on the rise of fall of civilizations. To name but a few: rise or fall of ancient Egypt, China or Rome. Significant climatic anomalies also led to the collapse of the Anasazi culture, the French revolution of 1791 or the Arab Spring of 2011. Thus, the inner dynamics of a given society will always respond to current enviromental constraints and cultural environment.

It is also important to stress that many empires (states that were able to exert influence over other states and dominate them) collapsed very rapidly and in a non-linear manner as empathized above – starting with Rome and ending with the decline of the British Empire at the beginning of the second half of the 20th century (the fall of Russian (USSR) empire at the end of 1980s' or of the former Central and Eastern Europe in 1989 may be added too). For example, the Roman Empire, or more precisely its western part, succumbed to barbarian invasions in roughly fifty year period. In 452 AD, the empire lost the whole of Britannia, most of Spain, a large part of Gallia and the Roman province of Africa. By 476 AD, the Western Roman Empire was no more and technological skills and the procedures and operations of the imperial administration faded out, competent officials and clerks disappeared and international trade, crafts, education and mass production vanished (Tainter 1988).

Pillars of the western world

According to Heraclitus Law, what modern western societies consider to be pro-growth factors are the same that logically become depleted after some time and, in the end, drive the system into a period of stagnation and crisis. The relevance of the Heraclitus Law which has profound bearing on a system's resilience ability can be tested with the help of a selection of principal factors on which our "western" civilization has grown. They include institutions, free access to information, free competition, private ownership, an independent middle class and social care. All these, of course, together

with the observance of ethical principles, social contract and implicit law constitute the essential elements of a functioning society. Looking at these factors from a contemporary perspective, we may notice increasing dysfunction of the system.

The essential significance of these elements may be demonstrated by looking at the proliferation of bureaucracy. This, at first instance, is unequivocally a positive phenomenon – the growing complexity of a system requires the development of a level of professional administrators with various specialisations. After a certain time, this ever growing class of administrators becomes so numerous that it proves to be less and less efficient. To compensate for this trend, the system takes in still more administrators and a vicious cycle begins to unfold, resulting in the diminishing of free resources that are tapped by interest groups resulting in the system decline in a pace that corresponds with the growth of nepotism and informal, mafia-like structures.

Free access to information creates parallel worlds with fancy virtual realities and social bubbles which provide completely erroneous base for decision-making processes; scientific research faces increased bureaucratic constraints and commercialisation in general where the Bell curve implications rule the arena and decides what is good and what is superfluous (from a short-term point of view). Free competition is brought down by massive regulations and a legal jungle; private ownership is replaced by anonymous and corporate ones; middle class is increasingly vanishing and thus the social contract is becoming weaker and there are more and more limited ways how to solidify cohesion in the society. Social benefits contribute to immense growth of diminishing returns and the institution of the family is being destroyed. This leads to a general feeling of emptiness, disorientation, lack of vision, and leadership and compromised long-term planning.

Last but not least, it must be emphasized that growing systems increase their complexity. Such a trend requires a constant flow of cheaper energy not only to sustain it but above also to enable further growth. Qualitative leaps usually occur in the context of discoveries of new sources of undeniably cheap form of energy, such as, in the past, the burning of coal or discovery of oil or nuclear energy. In our world, different forms of energy are becoming more costly. Can we thus hope for the next quantitative leap or rather expect a crisis?

Elites

There remains one more essential factor that significantly impacts the inner dynamics and performance of a given system. It is the role of the elites and leadership in general. There is no doubt that the current world which is full of constraints and formalised and codified procedures creates the space suitable for the growth of real elites and leaders less suitable. Strong tendencies towards regulation and intensive codification in order to rule out everything out of 'standard' is one of the primary characteristics of a society facing its crisis. This makes the "elites" largely inert when addressing a looming crisis. In its incipient stage, the crisis primarily affects the majority of population, which quite logically does not have the resources and often not even the ability to respond to imminent and increasing difficulties. It is only after this segment of society is severely affected and stressed that the elite also becomes aware of the growing crisis. At this stage, however, it is often too late for any effective measures;

moreover, such measures don't meet with acceptance and support from the already severely affected majority population. The result is that the elites lose their legitimacy, and consequently they are unable to push through appropriate solutions. The crisis thus exerts its full impact and unfortunate consequences are unavoidable.

Linear or cyclical

One of the relevant questions history poses is, of course, the manner in which civilizations develop over time and the degree to which everything really does repeat itself. To what degree does the linear approach to history, when everything keeps moving ahead and the time axis is divided into shorter sections of development of identical length, include elements of cyclical? The theory that cycles have occurred, not only in the distant past but also recently, is indicated by a very specific analysis of the development and evidence for crises in the United States of America in the period from 1780 to 2010, *i.e.* from the beginning of the American republic until the present. According to, Peter Turchin, two regularly occurring cycles have occurred during this specific period. The first cycle was approximately fifty years long with oscillations culminating around the years 1870, 1920 and 1970. The second cycle was much longer and can be only roughly defined; Turchin calls it the secular cycle – a cycle characterised by the Long Depression in the second half of the 19th century and framed by periods of calm and prosperity at the beginning of the 19th century and during several decades in the middle of the 20th century. This means that the cycle continued for a little over one hundred years. If the above observations are correct, another major crisis could be predicted around 2020 (Turchin 2012). The merit of the study lies especially in the fact that it tries to identify major factors causing uneven dynamics of society.

Secular cycles may be found practically in all agrarian civilizations where reliable records exist (China, Near East, South-East Asia). In contrast, the fifty-year cycles do not necessarily always occur. This means that there must be certain universal laws that lead to the incidence of secular cycles irrespective of the regional or historical context. The explanation may lie in structural-demographic theory. The excess pressure of the labour force in relation to limited job opportunities leads to enormous stress building up on the social institutions of a given society. This is reflected in constant pressure on price inflation, reduction of real wages, decline of villages and migration to towns, and leads to more frequent protests against existing wage conditions and to food riots. Simultaneously, the rapid rise of the young generation results in *elite overproduction*, when the number of applicants for elite positions is much higher than their availability (Motesharrei, Rivas, Kalnay 2014). This leads to the development of “interest groups” that to an extent act on behalf of the failing state and tap the resources that become more and more scarce. The resulting networks link members connected through family or professional interests and drive off any alien competitor for influence or increasingly declining resources. The consequence of these trends is the inflation of the bureaucratic apparatus and the army, *i.e.* of the power forces of the state. Everything culminates in a fiscal crisis, with resistance from both the elites and the people, and the central power of the state becomes severely eroded. Elites (authorities and political parties) infighting intensifies. The next part of the cycle begins and the social contract comes to an end.

It has been shown that it is the brief periods in history that punctuate a long-term trajectory of a given civilization/society's development. These ‘leap periods’ occur when all subsystems of the whole are prone to a profound change due to a critical level

of small dysfunctions. The dysfunctions may occur due to environmental or socio-economic factors. The distribution of these major leaps is non-linear. If such leap periods start to follow one after another and cease to be divided by uneventful periods of saturation, a major collapse is approaching. For modern military thinkers, by looking at 'deep time' data from a comparative perspective and the observation that there have always been generally valid principles on which civilizations operated during their development (birth, rise, fall, crisis and regeneration) may be relevant to include them in their own analyses of modern forms of conflicts and their forms.

There is no question that civilizations in the historical record have been able to survive without being faced first by a growth and then by a subsequent decline of their complexity. We usually refer to the rapid loss of complexity using the somewhat misleading term "collapse." This is not a fitting term; its common definition comes from natural sciences, where it very often denotes demise, extinction and the like. What is important to emphasize when studying historical processes is that to understand this issue it pays to look for the factors responsible for the initial rise of a cultural system. They are usually the same factors that later bring the system to a crisis. A crisis, however, does not necessarily mean an ultimate end or 'collapse'. On the contrary, it is a period that usually leads to a restart of the system with new and different opportunities.

How can the impact of a looming crisis be minimized? The answer is simple, but the implementation extremely intricate. What it requires is first of all a streamlining the individual parts of the system, making them easier to perform efficiently and, consequently, reducing the cost of running it. What always happens in reality during the course of the development of society is that growing complexity involves the rising costs of maintaining it, which is followed by a more burgeoning complexity (in other words, the rising living "standard") of society. "Innovation" is often presented as the solution to problems associated with growing complexity, however, as discussed here, it is possible to prove that the effectiveness of innovations diminishes hand in hand with rising complexity (Strumsky, Lobo and Tainter 2010). This unavoidably leads to the well-known phenomenon of diminishing returns. Significant effects of this trend are already being felt today. To simplify the system and make it more effective is nay to impossible due to the vetocracy principle (Fukuyama 2015). Vetocracy means that all participants in the system are ready to oppose any trend that would make the system more efficient because it would unavoidably mean the reduction of their positions.

In summary, as shown here, archaeology has much to offer military thinkers today. Civilizations develop at the same time both linearly - they never go back to the same point where they started - and cyclically, in the sense that they are characterized by several general stages they have in common - birth, rise, peak, descent, crisis and regeneration. The punctuated equilibria theory says that under standard conditions the factors responsible for the rise of a certain social system will also precipitate its crisis. It can aggravate even more if similar tendency, instability and worsening of the climate comes into play as well. Any stage of the collapse of a social system can be understood only if we succeed in analyzing the manner in which the system was formed and identify principal factors contributing to its rise (Heraclitus Law). If the theory is right, then we can evaluate any given society by identifying factors on which it built its proliferation. If we recognize that these very factors are becoming less and less performative, if leap periods become more and more frequent, a crisis may be predicted. At the same time,

the situation today is exceptional – we have all the means, technology and knowledge to identify this mechanism. Since we know how it operates, we can attempt to design and carry out in-depth reconfiguration/creative destruction to prevent the worst losses. This can be done only with the help of science, technology and – yes – knowledge of history and long term trends. At the same time, the theory gives us a powerful tool for evaluating the current stage of development not only of our but of other societies exposed to the analysis as well.

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Collapses that have Changed the Modern World: The Theory of Punctuated Equilibrium in Practice

In his lecture, Professor Bárta explained the Punctuated Equilibrium Theory. At the end he mentioned two recent, yet already classic examples of this theory in practice. Now allow me to look, together with you, at three fateful historical turns, which, in my opinion, correspond with this theory in all respects.

At the end – in the same context – I would like to briefly meditate on the condition of today's world and one of many threats that we will have to face, sooner or later. My examples should clearly show where the strength of this theory dwells and why it is important for understanding today's world.

The first, now already classic example of a collapse of complex society in modern European history was the collapse of Bourbon France and then the whole of Western and Central Europe at the turn of the 18th and 19th centuries. It is typical, completely in the spirit of the punctuated equilibria theory, that nothing had initially indicated an imminent catastrophe of such magnitude. Regardless of a series of problems, which I will address shortly, the French absolutist monarchy appeared stable in all respects – politically, socially, as well as demographically.

It occurred despite the long-lasting economic difficulties and the slow, inconspicuously growing signs of the system's instability manifested by dissatisfaction of the commons/ordinary people (the "third estate"), which was "contaminated" by the ideas of enlightenment. Until 1789, in spite of these problems, almost all monarchs in Western and Central Europe and members of West and Central European political elites admired Bourbon France with its classical (hierarchical) "ancient regime" as an exemplary functioning state structure and tried to imitate it more or less successfully.

Therefore, it came as an even greater shock when the country suddenly found itself in the middle of a deep political crisis in the spring of 1789. The revolt of the commons/"ordinary people", which from day to day refused to play the role of that "who, with some exaggeration, paid for everything, but could not decide anything", stood at the beginning of the revolution, a fundamental transformation of all subsystems of society or –in the words of Miroslav Bárta – a collapse, which "did not mean the end of the world", but which was a sudden end of the Western World in the form it had existed for the past three centuries.

It was not only the fall of the "model" French absolutist monarchy; it was also a fall of other monarchies of its kind in Europe, a total disintegration of an established social order and establishment of a brand new "social system". It was a failure of most of the spheres of life and functioning of society in the sense of its identity, quality and legitimacy of the elites, economic performance and, to some extent, transformation of the natural environment. The system was unable to cope with so many crises together – to name just one, for the lack of energy.

What then was the cause of the revolution, this crucial break of modern French and European (world) history? The following factors proved decisive, especially with the passage of time:

- the lingering financial crisis of the French state, caused also by the fact that the clergy and the aristocracy were – in fact – exempted from payment of the majority of taxes;
- this resulted in the indebtedness of the French monarchy, resolved by further loans, not by attempts of rational economic reform of the system, or by a failure of these reforms (by general inspectors of the Treasury; Turgot, Necker, Calonne, de Brienne);
- the fact that, despite the growth of “industrial” manufacturing, domestic and international trade, and agricultural production, France did not experience an “industrial” or even “agricultural revolution” of the English (British) type, which coincided with a significant political transformation (“democratization”) of the system;
- a dramatic crop failure, a “wine-making crisis”, soaring prices and unemployment as well as a severe winter in the pre-revolution year of 1788, as the “X Factor”;
- the long crisis of the French Catholic Church (the process of de-Christianization, i.e., alienation from the state and the subjects of the Crown);
- lethargy and impermeability of the French estate society;
- outdated and inflexible administrative and fiscal structure of the monarchy;
- corruptness of the royal officials and sale of the royal offices;
- failure of the judiciary and justice reform;
- the ensuing weakening loyalty of the elites towards the Crown (the end [or emptying] of the symbolic and emotional “investment” towards the monarchy / the royal regime);
- the “subversive” influence of the enlightening philosophic “propaganda” (“ideological/philosophical foundation” of the revolution – Montesquieu, Diderot, Voltaire and Rousseau, the “social treaty”, “books of complaints”, etc.);
- the rising importance of public opinion and discontent of (but not only) the commons/“third estate” (“industrialists”, traders, financiers, professionals and some of the urban and village population), and the clear articulation of new ideas regarding the arrangement of society and new political concepts (Keith M. Baker, Lynn A. Hunt).

To sum it up – it was primarily a “collapse” of the political aristocratic elites (a crisis of the French nobility, a “tragic epilogue of the slow suicide of the ruling class” – Hyppolite Taine, Alexis de Tocqueville, Eric Hobsbawm) and their inability to evaluate the situation in which the regime found itself (loss of good sense and rational self-control) and adequately respond to the “revolutionary” situation (the political crisis and desire for “new legitimacy” in 1789).

Just the interconnection of these factors, which alone could not cause the crisis (“none of the causes of the revolution can alone explain its scope” – François Furet), in a single inevitable moment caused the fateful “distortion of the (fragile) equilibrium” and started the French Revolution as well as the arrival of the sub-lateral, potentially non-controllable lower social classes and their fatal consequences. As we can see, the system was changed for reasons that are completely “modern” and highly topical. The seemingly “immortal” state/state formation was completely destroyed within a few weeks.

Up to now, historians, philosophers, political scientists and other experts have not been able to agree on whether the French Revolution stood at the birth of modern civil society and political democracy or – on the contrary – at the beginning of the most acute contemporary problems, including the newly conceived totalitarianism. However, they are unanimously in agreement with one factor: the effects of the “collapse” of the French absolutist monarchy on the further development of the country, Europe and the whole world were utterly fatal.

The second example of total “collapse” of a complex society is the break-up of the European balance of power and eventually of the whole continent at the beginning of the 20th century. Paradoxically, European society had probably never seemed as stable as then (the year 1913 was one of the best in terms of economy, science and art), despite all of the complicated problems which it had encountered in the last quarter of the previous century. Yet, the sudden “collapse” resulted in the First World War, unprecedented human and material losses, and disintegration of four large empires – Russian, Austro-Hungarian, German and Ottoman, which had functioned for several centuries.

It is remarkable that if we carefully study the official diplomatic negotiations of the last two or three decades before the First World War, or the numerous backstage talks and private remarks of the decision-makers until the summer of 1914, we will not find any hint of worry that a “collapse” of similar magnitude might occur, much like in the case of the French Revolution. The famous book *The Sleepwalkers: How Europe Went to War in 1914* by Christopher Clark shows exactly how the elites were caught off guard by the Great War and how completely they failed to understand what had happened to “their world” in the course of a few weeks and months. The fact that a (seemingly) fully functional and, in most respects well-operating organism could collapse like a “house of cards” and result in an unprecedented catastrophe in such a short while, was extremely frustrating, not only to the mentioned elites. Practically throughout the entire war and also in the post-war period, these people looked for an answer to the question of how they could have been so blind and how they could have ignored all of the small, inconspicuous, but ever greater signs of the approaching “collapse”.

The collapse of the European civilization of the *fin de siècle* had, to put it simply, several major, mutually interconnected causes:

- the long-lasting unsustainable complexity of the system of international relations (existing already in the “global world”), complicated ties, alliances and enmities between the great powers and their “clients”, i.e., small, seemingly unimportant states to which their links to the powers rendered importance;
- the existence of two alliances opposing each other in most respects (Triple Alliance [1882] and Entente [1894, 1904 and 1907]), and the “powers of the second rank” tied to them (see above);
- a sharp increase of diplomatic crises (e.g. the Fashoda Incident [1898], the Moroccan crisis [1905-06, 1911], the Bosnian crisis [1808] and local wars (e.g. the Russo-Japanese War [1904-1905], the Italo-Turkish War [1911] and the

Balkan wars [1912-1913]), which repeatedly brought Europe to the edge of “collapse”;

- increased importance of the colonial policy, which could have led to a global catastrophe even in a “seemingly unimportant clash in an insignificant place somewhere in Africa”;
- relocation of the internal political issues of great powers to the international scene with all of the ensuing consequences (for example, an attempt by Austria-Hungary to resolve its lingering internal political crisis by at least a somewhat rapid, but victorious war with Serbia);
- the “long peace factor” (absence of a “great war” between the European powers from 1855/56 until 1914);
- the birth of modern nationalism (for example the murder of Jaurès in France);
- a war as a “revolution” and the program of “new modernism” (e.g. Italian futurists and their manifesto – Marinetti);
- an illusion (especially by the young generation, but also the European political leaders) about the future war (so called “war of illusions” – Fritz Fischer: *Krieg der Illusionen*);
- coincidence of unfortunate political developments in the summer of 1914 (the Sarajevo assassination and its consequences).

To sum it up – again, much as in the case of the French Revolution from the end of the 18th century, it was a “collapse” of the European political elites (international elites), their inability to critically evaluate the fact that the system of international relations practically escaped their control, not to mention the utter inability of self-reflection (Aleš Skřivan: *Císařská politika* [The Imperial Policy] and others).

The penalty which the elites paid for the creation of a long-lastingly unsustainable system of international relations was cruel – not only the collapse of Stefan Zweig’s “World of Yesteryear” (Stefan Zweig: *Die welt von gestern*), but also the birth of George Orwell’s “world of the future” – the world of fascism, Nazism and communism, i.e., the world of modern totalitarianism (George Orwell: 1984, *Animal Farm*).

The last example of a collapse of a complex society which I have selected for today’s seminar, is the disintegration of the so-called Eastern Bloc and – said in the words of Ronald Reagan – the “Empire of Evil” – the communist Soviet Union from the turn of the 1980s and 1990s.

Also in this third case, nothing indicated this sudden, swift “collapse”. Not even the brightest Western Kremlinologists or the most optimistic representatives of the dissent in communist countries anticipated something like this in the foreseeable future.

It happened despite the fact that the Soviet Union and its satellite states had experienced a process of gradual, long-lasting decline – both economic and ideological. Unlike France in the late 18th century, and in contrast with the situation in Europe on the eve of the Great War, there were certain clearer symptoms that “global communism” had no future. Despite this fact, the system looked relatively stable and any deliberations about its potential end oscillated within several decades at least. Yet communist leaders in the Soviet Union and the Eastern Bloc found themselves –

suddenly, almost from day to day – in the position of men who had to face the consequences of a sudden “collapse”.

What were the main causes or factors of this “collapse”?

- a fundamental change of the foreign policy of the United States and its allies to the Soviet Union and its satellites (reevaluation of Kissinger’s/Nixon’s and Ford’s policy, or Brzezinski’s/Carter’s policy of détente connected with the coming of Ronald Reagan, Margaret Thatcher, Helmut Kohl [and partly also François Mitterrand] to power + the “John Paul II factor”);
- the development of the global economy (for example the end of “oil shocks” and high oil prices, which strongly contributed to the partial economic self-sufficiency and relative “prosperity” of the Soviet Union and its “vassals” in the 1970s);
- the loss of competitiveness of the centrally directed economies (a dysfunctional system of state planning) and lagging behind the West in all spheres of life;
- stagnation of the living standards of the population and the ensuing disillusion regarding the long-lasting sustainability of the communist system;
- actual collapse of a “social contract” between the leaders and subjects in the sense of “we will let you rule in peace and you will let us live as peacefully and decently as possible”;
- a complete failure of Gorbachev’s reforms (“the perestroika and glasnost”; Karel Durman: *Útěk od praporů, Popely ještě žhavé I a II*) [*Escape from the Battalions, Ashes Still Hot I and II*];
- increasingly frequent repressions by communist governments towards individuals or small groups of opponents who were practically unable to threaten them at all;
- loss of the last remains of legitimacy of the rigid political system built on the power monopoly of a single political party and the repressive state establishment (“loss of the faith” even among the actual members of the establishment – the nomenclature);
- absence of a “will for power”; it means the reluctance of most of the communist elites to keep the system in power even at the price of massive bloodshed (with the exception of Communist Romania);
- fateful chaining of events in the “miraculous year” of 1989 and the inability of the communist political elites to adequately react to these events.

As you can see, even with knowledge of the complicated, long-lasting causes, this case also concerned – much like the previous two cases – the consequence of a total failure of the political elites to critically evaluate the condition and the phase of development of the economic and political system of the country/countries which they were leading. Precisely these elites were primarily responsible for the collapse of the Soviet Union and the communist countries of the Eastern Bloc.

If we consider all three “collapses” of complex societies in modern European history which I have referred to, we have to arrive at a relatively clear conclusion.

Apart from the fact that they were utterly unexpected and despite some long-lasting and at first sight inconspicuous factors, which had a crushing impact on the given complex society in the end, the main cause of the “collapse” in all three cases was

a total failure of the political elites and their inability to perceive the gradual accumulation of the crisis potential in the individual subsystems of society as a whole.

This conclusion leads me to the last part of my paper and a brief meditation on the condition of today's Western, namely West-European society, i.e. whether similar factors as those that I have mentioned cannot lead, together with the blindness of the European political elites, to a gradual corrosion of our world and its "collapse" in the foreseeable future.

Without underestimating any known threats and risks that threaten the present Western civilization (lack of resources, mainly water, environmental problems including global warming, uneven demographic development, religious clashes, tension between the major powers, international terrorism, consequences of "large migrations", etc.), I think that the most significant problem lies elsewhere. In my opinion, just as it occurred at the end of the 18th century in France and at the end of the communist era in Central and South-East Europe, the main problem of today's world is the fact that the "social contract" between the "rulers" and "those to whom they rule", i.e., between members of liberal political elites and a major part of the West-European society finds itself "at the edge of its lifespan".

It is not the first time that individual European countries have experienced something similar over the past fifty years. In stable Western democracies it has, for example, happened in:

- Italy, where, in the first half of the 1990s, the stable system of the Christian Democrats and the Socialists suddenly collapsed and Silvio Berlusconi's *Forza Italia* came to power, crushing the political system that had functioned since the end of the Second World War;
- Austria, where, in 1999, Jörg Haider's Freedom Party entered the government of Wolfgang Schüssel's People's Party, which led to a sharp conflict between Vienna and Brussels.

In recent years, the situation has become different, more critical. A major part of the West-European electorate opposes the establishment, i.e. the existing political system in many countries simultaneously. I can choose from many examples:

- Austria, where Norbert Hofer, a populist candidate of the Austrian Freedom Party, only very narrowly lost to the long-lasting member of the establishment Alexander Van der Bellen in the presidential elections;
- The Netherlands, where the nationalist Party for Freedom of Geert Wilders unprecedentedly came second in the parliamentary elections;
- France, where Emmanuel Macron, a politician sharply opposing the established political parties, i.e., the Republicans and the Socialists, won the presidential elections, and Marine Le Pen, representative of the extreme right-wing National Front, came second;
- Great Britain, where, despite recommendations from their political leaders, voters decided to vote to leave the European Union (the so-called Brexit); moreover, one year later, the Labour Party became the second strongest party with Jeremy Corbyn as a leader, a leader who is a radical similar to Hofer or Wilders, although of a different, left-wing type (his statements on the necessity of British, or better, global, disarmament, and British departure from NATO are perhaps even more dangerous for the West);

- the United States of America, where Donald Trump defeated his own Republican Party as well as the opposing Democratic Party in the presidential elections, including all of the big media and many influential corporations, which will probably appear in textbooks, and not only about political science.

What do all of these politicians and their achievements have in common?

Exactly what I have been speaking about for some time, that is:

- all of these men and women strongly defined themselves against the existing political elites;
- all of them decided to stand up against counterproductive political correctness, which has been a characteristic of Western civilization over the past few years;
- all of them profit from the feelings of people, who vote in free elections dramatically differently from the wishes of the establishment and move their countries and “our world” perhaps to the edge of another “collapse”;
- they take advantage of the fact that the frustrations of their real and potential voters need not stem from their particularly gloomy economic situation, as is frequently wrongly presented, but that it is a subjective feel of these “people on the edge” of being abandoned by their existing political leaders and their political representatives who have completely lost interest in them, have not even the slightest idea of how they live or the slightest awareness of their problems, worries or fears.

The successful “new type” politicians, all those Hofers, Wilders, Macrons, Le Pens and Corbys have one great advantage over the members of the establishment – they have never been, with a few exceptions, a component of the governmental structures, or have otherwise managed to cut themselves off from their activity in the state executive. They have managed to convince the public that within the classic division of “us and them”, they are on the same side as the long-lastingly frustrated part of the electorate.

What does this mean for us?

Based on historical experience, I dare say that if the liberal political elites of the Western world really lose the trust of most of the citizens, or most of the electorate, which has been indicated over the past few years, they will meet with the same end as the political elites at the time of the French Revolution, Europe at the beginning of the 20th century, and the communist leaders at the turn of the 1980s and 1990s. If this really happens, it will inevitably lead to another “collapse” in the spirit of the “punctuated equilibria” theory where, however, each of us will become a victim together with these elites.

To conclude my lecture, I wish to say that – however naive it may sound – one of the ways of preventing this development is that we really draw a lesson from history. That not only economic and natural sciences, but also historiography, archaeology and other humanities / social sciences are – as regards an analysis of today’s condition and prediction of future development – without any exaggeration strategic disciplines that should be taken seriously by today’s decision-makers.

The fact that we are here, among you, gives us hope that it could be like this.

Karel Rehka*Multinational Division North East Deputy Commander*

The aim of this paper is to elaborate on Punctuated Equilibrium theory and its implications for today's militaries as well as on the utility of social sciences in general. I will not try to present a scientific study, but rather to provide a few ideas and observations on this topic from a military practitioner's point of view. The text describes the essence of my Potomac Institute seminar presentation that was designed as complimentary to Professor Barta's seminar presentation on Punctuated Equilibrium theory in strategic prediction and Professor Kolar's presentation on Punctuated Equilibrium theory in historical case studies of social collapses.

It is important to mention that the following text presents my personal ideas and opinions. It does not necessarily demonstrate the official position of the Czech Ministry of Defense or Czech Armed Forces.

Having spent over twenty years in various military appointments, mostly in Special Operations Forces, I have always been more oriented towards the practical than the academic side of my work. While serving both in my country and on operations abroad, and while gaining more practical experience I gradually realized the value of theory and academic study for my everyday military life. Over those years I found especially useful, if not necessary, the study of history. Shortly after meeting and starting cooperation with professors Barta and Kovar of Charles' University in Prague I was also introduced to Punctuated Equilibrium theory (which I had never heard of before). Since then I have become even more convinced about the utility of social sciences for military practice, in particular the study of history.

Value of science, military revolutions and Punctuated Equilibrium theory

Throughout this paper I have chosen to use a few quotations. Some of them originate from our real or potential adversaries. I chose them deliberately. Such quotations should remind us that we are not the only ones who understand the value of science for military affairs and the conduct of warfare. I also believe that it should motivate us to be the leaders in this game.

Writing about the value of Punctuated Equilibrium theory and science in general, I found particularly inspiring what the current Chief of the General Staff of the Russian Federation General Valery Gerasimov wrote in his famous article: "*A scornful attitude toward new ideas, to nonstandard approaches, to other points of view is unacceptable in military science. And it is even more unacceptable for practitioners to have this attitude toward science.*" It always reminds me of the long term Soviet and Russian tradition of utilizing science for military purposes. It also tells me that no matter what crisis we face and what the current state of our military is we can (and should) always develop intellectually.

Studying history and the historical development of warfare is critical for understanding current and possible future trends. Using Punctuated Equilibrium theory in studying and interpreting military history is nothing new. Nowadays the well-known concepts of Military Revolution or Revolution in Military Affairs provide us with

a useful and often used analytical framework for assessing developments in warfare. It was first formulated by the English historian (by the way, not a military historian) Michael Roberts in his lecture in 1955.

He identified a hundred years' period of Military Revolution between the 16th and 17th centuries mostly related to military tactical reforms conducted by Maurice of Nassau and Gustavus Adolphus that were designed to leverage advancements in technology and that ultimately led to the deployment of larger uniformed armies and follow-on social, economic as well as political changes and the modern era centralized nation state.

This Military Revolution concept became a new orthodoxy that lasted until the 1970s but was finally challenged by other historians and other Military Revolution concepts were developed. I believe the real value of Roberts' approach is the holistic approach that covers not only technological or military developments but also shows their interrelationship with social and political factors (similar to Clausewitz's view). This provides us with a useful analytical framework to explore and assess developments in warfare in relation to society as a whole and supports a complex historical view.

In his 1993 article, US professor of history Clifford Rogers described a different revolutionary developments starting during the Hundred Years' War in the 14th century. In seeking to answer the question: "*just how did the West, initially so small and so deficient in natural resources, become able to compensate for what it lacked through superior military and naval power?*", he came to the conclusion that it was through a whole series of synergistically combined revolutions rather than through a single Military Revolution. He offers the Punctuated Equilibrium Evolution theory as a suitable conceptual framework to describe this development based on Punctuated Equilibrium theory developed in the field of paleontology in the 1970s.

The original Punctuated Equilibrium theory (originating in paleontology and evolutionary biology) challenged the orthodox view of gradual evolution by the idea of development in "jumps" that are preceded and followed by long periods of equilibrium. It was later applied in various other fields including social sciences. Regarding social systems, Punctuated Equilibrium theory proposes that social systems develop in sudden periods of complex changes that punctuate long periods of seemingly uneventful development. The same applies to the development of warfare where long periods of equilibrium are punctuated by sudden and complex military revolutions. This approach of Punctuated Equilibrium Evolution combines both incremental and revolutionary changes in the development of warfare.

There is a lasting dispute over whether the development of warfare materialized by gradual evolution or in sudden quick changes, i.e. revolutions. Looking at the evolution vs. revolution dispute, I personally believe it is a matter of point of view. For example, when I look at the timing and graphics depicting social wave theory or four generations of warfare I always get a feeling of revolutionary changes in warfare. These theories are mostly based on significant social shifts caused by agricultural, industrial and information revolutions. On the other side, when I look at the timing and graphics depicting the longer term view, like the one based on research by British archeologist and historian Ian Morris, it looks to me more like incremental evolutionary development. So it really seems to me that it is more about the point of view and the time scale.

The point I want to make here is that, being a practitioner, this philosophical debate doesn't really matter so much to me. What matters to me is to have a sufficiently complex and robust analytical tool, which Punctuated Equilibrium Evolution seems to provide. More importantly, the Punctuated Equilibrium paradigm provides an analytical construct with which we can define the dominant characteristics of Military Revolutions and it also offers a predictive, interpretive model for the future, since it establishes a pattern of change. In short, it combines the best of both (incremental and revolutionary) and it is predictive in nature.

Predicting the future

While trying to predict the future is always a tricky business, we cannot avoid it. It is exactly where applying scientific approaches is both valuable and necessary. In fact, the function of prediction is the key for military science. It is also where Punctuated Equilibrium theory becomes a useful tool. The previously quoted Valery Gerasimov could not have put it better: *"Each war does present itself as a unique case, demanding the comprehension of its particular logic, its uniqueness. That is why the character of a war that Russia or its allies might be drawn into is very hard to predict. Nonetheless, we must. Any academic pronouncements in military science are worthless if military theory is not backed by the function of prediction."*

So how will future warfare look? If I knew the answer, I would probably be a very rich man by now, which I am not... What we know for sure is that the environment in which our militaries will operate is changing fast. We will more often operate in areas densely populated by highly interconnected people and those people will be our future "key terrain".

The development of technology will have an impact. Autonomous systems and artificial intelligence may be some of the key developments as we can see again in another quotation from Gerasimov's article: *"...use of modern automated complexes of military equipment and research in the area of artificial intelligence. While today we have flying drones, tomorrow's battlefields will be filled with walking, crawling, jumping, and flying robots. In the near future it is possible a fully robotized unit will be created, capable of independently conducting military operations."* Just like our Russian counterparts, our own western military leaders also anticipate the impact of a new technology and expect major changes in warfare. One of many illustrative examples is the following quotation from an interview with General Mark Milley, US Army Chief of Staff: *"...ubiquitous information technology and personal communications, proliferation of precision guided weapons, robotics and on-site 3D printing, and rapidly growing urbanization all augur a very different era of warfare."*

The bottom line is that we can expect a very different operational environment and a new era of warfare very soon. Punctuated Equilibrium theory can help us indicate when and how the shifts will be coming. I can see two major areas of using Punctuated Equilibrium theory for prediction in military matters. The first one is predicting changes in security and operational environments (e.g. changes in society and the roots of conflict). This is closely linked to the second one – predicting changes in warfare (i.e. how we conduct a war). In both cases the application of a scientific approach is helpful and needed.

Social scientists

As history shows us, war is a social phenomenon inherent in human society. Today's war is not a matter of the military but a matter of the whole state and the whole society with armed forces being just one of the tools. By the way, very few people realize and understand this key characteristic in my own country. Therefore, we can really consider military and warfighting to be social systems. Since humans are the "key terrain", I believe that social sciences, especially the study of human history, are relevant to predicting developments in security and operational environments as well as in warfare itself.

I am convinced that it is for our own benefit to get social scientists involved in our military affairs, not only for consultation but more as an integral part of the team. It is not only about their scientific research methods. The thing is that they look at problems from a different perspective and see them in a different context than us, military practitioners. They also tend to think differently and might be able to come up with different solutions. When we, military people, (understandably) tend to see the world through simple math, zero sum games and focus on short term black and white functional solutions, social scientists are more often able to see the world in its complexity, explore larger time scales, and see the grey and other colors next to our black and white. When we see isolated points, they can see continuum and patterns. When we think we go complex, they explore factors we would never expect to be relevant in the situation (climate, demography, gender, nuances in social hierarchy, water, crops, food, energy, etc.). Yes, you don't want to overcomplicate things when under enemy fire. The problem is that today's and future conflicts are less about winning the firefight and more about understanding and influencing. Understanding the security and operational environments and the full context of a conflict. Influencing both the threats and the environment to reach our goals. We need to see in grey and color and we need to look at long term trends and factors we would never think about. At the same time, we cannot become scientists, since we still need warriors to win wars. And that's exactly why I think that we should bring the social scientists on to the team.

The first time I saw Professor Barta he was delivering a presentation during one of the security oriented seminars in the Czech Republic. He was talking about crises and collapse in society using the Punctuated Equilibrium theory and the Multiplier Effect to describe the factors and indicators of developing crises and approaching collapses. He was talking about long term data, trends and patterns throughout rises and falls of ancient civilizations. He then projected those same patterns into our own modern society using various indicators. From this very first time, when I was watching his presentation it struck me how many similarities I could observe in our military. In fact, I thought he could be describing developments in my military by just changing the title of his presentation. Anything he was observing in our society I could immediately see happening in our military.

Collapse in the social system

The following eight statements are among the major conclusions taken from Professor Barta's previous work on collapses in social systems. They can be found in his books, lectures, and presentations. In the following text I will offer some of my personal observations regarding the relevance of these points to the military.

1. Crisis and collapse are integral to all social systems.
2. Collapse comes in a non-linear, “punctuated” way in multiple areas of the effected society.
3. Collapse is preceded by growth of complexity beyond a tenable point.
4. The Energy Return on Investment (EROI) declines – i.e. a society spends increasingly more energy with lesser effect before its collapse.
5. There is no single factor driving a society into the crises and collapse. It is always a mixture of multiple internal and external factors.
6. The factors originally stimulating growth and development of a society are usually the ones which will lead to its collapse.
7. Critical factors leading to a collapse of a society are present and can be observed in that society from the very beginning.
8. There are no quick and simple solutions to a crises and the collapse of a society. Only complex and system changes can work. Minor fixes maintaining the status quo further deepen the crisis and bring the collapse even faster.

Crisis and collapse are integral to all social systems

Let's start with an explanation of the word 'collapse'. Collapse in a social system is a sudden loss of complexity. Although it usually has a negative impact on the people living in the affected society, it does not automatically mean total destruction. A collapse may even be useful and help the society to get in better shape.

No system can grow forever. That's why crisis and collapse are integral to all systems. That includes the military and the way we conduct war. Militaries are usually highly centralized, complex, bureaucratic, hierarchical systems by nature, very much resistant to learning and changing. That makes it even more difficult to identify an approaching or ongoing crisis and to do something about it.

Moreover, we have a built-in problem with admitting any kind of our own failure in military, both externally but unfortunately often even internally. This is preventing us from reforming and innovating at sufficient speed. Every solution starts with admitting the existence of a problem. If we never let ourselves fail and we don't admit that we have a problem, we will not find a solution to it. How many times have I heard or read in our internal assessments that we failed miserably? Not too many times.

Collapse is normal for a society and therefore it must be normal for a military, since it is a social system too. The problem is that collapse in war may have far reaching consequences for our nation and therefore any crisis in our military and defense affairs must be carefully managed.

Collapse comes in a non-linear, “punctuated” way in multiple areas

Because a collapse comes in a non-linear way in multiple areas of the effected society, it is really important that we build our defense system to be simple, agile and flexible so it is able to react and adjust to those sudden complex changes.

Sadly, we are building exactly the opposite in our militaries – a rigid, bureaucratic system – and we are making it worse with any changes we introduce.

We always tend to be surprised by changing reality. Whether it was the rise of peace support operations at the end of the Cold War, the challenges of counterterrorism and counterinsurgency campaigns after 9/11 or now with the return of the Russian threat and potential high-intensity warfighting challenges, we have always looked surprised and reacted slowly.

Not only do we tend to be surprised by the changes all the time, we are not able to react to them fast enough. This applies to all aspects of our militaries, such as our capability development, procurement system (this is exceptionally broken in the Czech military), the mobilization system (which we pretty much destroyed in my own country), strategic supplies, legislation, training, education, etc. We are bad in our predictions, but much worse in our reactions. Recently, our often discussed but never managed increase in defense spending could serve as a primary example of our total inability to adjust to the new security environment at a strategic level.

It is even more challenging, since there are no minor fixes to the complex changes in our societies and operational environment. Complex challenges always require complex solutions.

Collapse is preceded by growth of complexity beyond a tenable point

Since collapse is a sudden loss of complexity it is always preceded by a huge growth in the complexity of the effected system. Every day I can see the huge growth of complexity in our militaries and it is happening in all areas.

It is also clearly visible in the way we conduct a war today. There are many examples but I believe that the way we command and control in operations is the most obvious one. Our command and control systems have become overcomplicated, absurdly expensive and resource (including personnel and time) demanding. It has become so big, complicated, rigid, slow and resource heavy that it is often more a burden than a support. We rely on it so much that we cannot fight without it anymore. At the same time, it makes us more vulnerable.

Even though we know about the developments of our potential adversaries in both technology and doctrine, we are not able to reform and change the way we do business. We continue to train and operate in a way that we know will not work. An example could be the sensor-to-shooter times we observe when Russia-backed separatists use indirect fire in Eastern Ukraine compared to our own inability to move our C2 nodes on the battlefield fast enough to survive. We are talking minutes vs. hours here. We know it, talk about it, and still cannot fix it. The fix would require complex changes in the way we think and act and we are not ready to do that. Other examples could be our overcomplicated and slow mission approval process, insufficient intelligence sharing, too much reliance on and misuse of information technology, dependence on unrealistically heavy logistics, risk averse culture and many more.

We know that if we are big and heavy it will make us slow, and slow will be killed on the future battlefield. We know it and still it is exactly what we are doing – building overcomplicated, big, heavy, rigid and slow forces. We just can't help it.

Recently it has been a great fashion to use the expression “mission command”, especially in the US military. The problem is that most of those using it do not understand its original meaning, so it is not applied properly. What a pity! I believe that the real mission command could be a solution to many of our current problems. It would bring more simplicity, flexibility and initiative into the battle.

Society spends increasingly more energy with lesser effect before its collapse

Declining Energy Return on Investment (EROI) is another collapse factor I can clearly observe in our militaries. The same time as we grow in complexity and bureaucracy we tend to invest more and more energy with lesser outcomes. Our culture of aversion to risk as well as huge sustainment requirements, which we got used to during our last campaigns, make things even worse. We got spoiled by fighting “comfortable” wars and now we take it as a norm.

When I was a young major, a much older general told me once: “*wise men talk C2 first, logistics second and leave tactics to the end.*” The ability to sustain our effort is what decides the war in the end, since war is a clash of wills. Declining EROI makes it increasingly difficult to sustain our effort.

Our current and potential adversaries know this too and they know it very well. They study our weaknesses and exploit them. Declining EROI and our continuous demand for a massive logistic support creates a weakness to be exploited particularly well by adversaries with asymmetrical strategies. Our leading asymmetrical enemy over recent decades, the terrorist leader Osama bin Laden, certainly considered this weakness in his planning. In 2004 bin Laden made a public address to the American people where he showed he understood the value of EROI: “*Al Qaeda spent \$500,000 on the event, while America in the incident and its aftermath lost — according to the lowest estimates — more than \$500 billion, meaning that every dollar of al Qaeda defeated a million dollars.*” This asymmetrical approach is not constrained to non-state actors like al Qaeda. Even our near-peer competitors like Russia may need to go asymmetric as Russian president Vladimir Putin expressed very clearly in his speech in 2006: “*We must take into account the plans and directions of development of the armed forces of other countries... Our responses must be based on intellectual superiority, they will be asymmetric, and less expensive.*”

No single factor drives you into crisis and collapse.

Since there is no single factor causing the crisis and collapse (and therefore also no single solution to it) we have to observe and assess the system in its complexity – be it operational environment or our own military.

We need a complex analytical framework and long term data for this and that’s where scientists come in really useful.

We also need a complex capability development system in militaries to be able to cope with what we find out. This is one thing we’re really missing in my military and I can see the consequences every day.

Things that bring you down are the ones that helped you up

The same factors originally stimulating the growth and development of a society are usually the ones which will lead to its collapse. State bureaucracy is a great example. Bureaucracy enables society to do much bigger things and run much more complicated projects. In this respect bureaucracy is hugely positive. It enables us to develop further. At some point though, the state gets too complicated and bureaucracy grows out of proportion. Finally, it consumes more energy than it can return into society and it becomes a major obstacle to positive progress. The same applies to the military.

An obvious example is the use of bureaucracy and technology in warfare. It is what enabled us to be faster and able to handle more complicated stuff than our enemies. But now we are coming to the point where these same factors make us slower and overcomplicated. In bureaucracy, we implemented standardized forms, requests, logs, evidence, procedures etc. It helped us to be more efficient than the enemy. Now, however, we have grown so complicated and bureaucratic that we spend more energy on doing the process right than on our core mission. I have experienced real world operations where people were more afraid of the approval process than of the enemy. Also, it is questionable how much the factory-like effectivity, which we are pursuing with our check-lists and rigid procedures, really suits today's fluid battlefield.

Another good example could be our inability to react adequately and fast enough to enemy false propaganda in Afghanistan (and other places), where the enemy was using the information technology which we developed against us, and we got so complicated in our command and control and our approval processes that we could not react effectively.

Critical factors are there from the start

Since the critical factors causing the crises and collapse of the system are present in it from the very beginning, it means that we can identify and observe them all the time. To be able to see them we must think strategically, long term, not only here and now. Our "Plan – Refine – Execute – Assess" methodology we practice in our military operations is relevant here, because what we really need is a continuous assessment of what we do and what effects it creates.

We cannot wait with our assessment, innovations and adjustments until we have a developing crisis. We must be proactive and preventive in nature. We must start assessing, innovating and adjusting right when we begin to design a system.

Since we need a complex assessment with a long-term perspective and deep understanding, history can help us understand.

Unfortunately, the word 'assessment' is too often a synonym for 'test' in my military. Honest assessments might bring up some negative points, maybe even failures and that's not wanted or acceptable (especially at the higher end of a chain of command). We are afraid of failing and as a result we are not able to adjust, innovate, develop and grow. Probably the most important thing we need to learn today is not to be afraid of failing, and to accept failure.

There are no quick fixes to a crisis of a social system

Since there are no single isolated causes of a crisis or a collapse in a society, there are also no quick and simple solutions to it. Only complex and system solutions can work. A complex challenge requires a complex solution. Quick fixes and minor corrections will only speed up the crisis and bring the collapse faster. Historically, when leaders in crises struggle for tighter control, micromanage things and make minor adjustments, they usually speed up the decline and deepen the crises.

The only way to cope with this issue is to assess both internal and external environments continuously from the very beginning focusing on major factors and long-term trends. We should always watch for disproportional growth in complexity, decline of EROI, and loss of agility and flexibility. We must always strive to make things simple, small, decentralized, flexible and energy saving. We must not be afraid to change.

Unfortunately, we – military people – often do exactly the opposite, whether in training or in operations. We don't promote leaders of change who are willing to fail. We promote those who can do things "properly" (as prescribed). When we see symptoms of problems, we cannot start searching for its roots or just ignore it if it's not important whether we understand the problem or not. We take tighter control, micromanage, and return things back into "the order". It often means that instead of looking for new ways to success we reinforce the failure.

Final words

Let's just highlight some of the major points described above.

It is important that military practitioners understand how warfare develops. Complex changes can be expected in modern warfare in the near future. In fact, there will always be changes in warfare just like the whole society keeps changing. War is a social phenomenon. Social sciences, and the study of history in particular, can help us understand current trends and potential future developments in warfare. Punctuated Equilibrium theory is a suitable conceptual framework for studying history as well as the development of warfare. Moreover, it is an analytical tool and it is predictive in nature.

Our militaries should reinforce our cooperation with social scientists and historians. We can only deal with problems when we understand the situation, the context, and how it develops over time. Social scientists and historians can help us understand this. They look at the same world through different lenses, think about it differently and might come up with solutions we could never discover. We should make them an integral part of our team.

We should also thoroughly assess our military systems, adjust and innovate from the start and continuously. Whatever we do we should always strive to stay simple, agile, flexible, with the lowest possible energy consumption and exercising true Mission Command style leadership.

The importance of history for the modern military is not a new discovery, but still it cannot be overstated as this final quotation from Confucius shows us: "*Study the past if you would define the future.*"

Otakar Foltýn*Special Forces Directorate, General Staff of the Armed Forces of the Czech Republic**Playing football on a tennis court*

For more than five years there is a fruitful cooperation between academics especially from the Charles University in Prague and some Czech General Staff officers. Especially in the European environment, it is unique cooperation and it resulted in some interesting studies. One of the examples is a study concerning the use of the punctuated equilibria theory for analysis of the operational environment.

Even though punctuated equilibria theory and multiplier effect were formerly formulated for an evolution of living organisms, scientists like professors Bárta and Kovář from Charles University, have shown how to use them for human systems - civilizations. We are confident about their applicability to the evaluation of the future operational environment. The first implication might be the relationship between the punctuated equilibrium theory and so-called revolutions in military affairs but it is not. The main focus of our research is aimed at the changes to the security environment but we do not think that we are facing something completely new. The principles of armed conflicts are still the same. Just try to imagine a reaction of Mister Sun C confronted with current Russian doctrine? I guess that he would say something like: Well, except the technology, you have invented nothing new in the last 2,500 years.

What is new? Definitely, it is an advanced scientific research what offers us new instruments. Our main areas of interest are military aspects concerning ecology, resources, economic, technology and population development. The combination of all these areas creates a cocktail of variants and some of these combinations indicate future security problems. Even though these combinations are sometimes extremely complex, it is the first time when we have technological, statistical and especially social science instruments for understanding even such complicated phenomena. The speed of transformation is now even faster than any time before. The understanding of the complexity of mentioned phenomena and the ability to adapt will strengthen the resiliency of societies at every level but on the other hand is the understanding of all these aspects very often weakened by western tendency to think linearly and to fight battles which we like, and not those which might be effective. It does not mean that we do not need classical military instruments but it means that it is not enough. Western soldiers are still focused on decisive battles but future “decisive battles” may look completely different than we would like them to and most of them will not be battles at all.

We like football but at least sometimes we should be playing tennis

The first problem we face is not the high complexity of the development of societies and civilizations, but the (military) conservatism, which is an inherent part of nearly all military structures. It is not a surprise that we still prefer so-called “symmetric” approach, which is typical for the first three generations of modern warfare (Lind), where every killed enemy or destroyed tank is a simple “plus” point. There are no

doubts that so long as there are tanks, bombers, and artillery we still need these instruments and abilities too. However, even though we know that war is never the same, we still prefer to fight past wars. At least in one aspect, we do that. In a globalized world filled by modern technologies, social media and artificial intelligence we are fighting the old enemies: our conservatism, intellectual comfort and inertia of our minds.

We still love playing football as a masculine clash of will, strength and a direct approach. In every moment of the struggle, the result has to be clearly visible. It's a pure duel of wills, physical skills, and mostly straightforward tactics and the counting is so simple: if your score is higher, you are the winner.

In fact, we should prefer tennis. In the complex and globalized world, the whole “match” is a process and it is essential to understand its complexity. Like in tennis, it is not necessarily so important to win in more exchanges (of fire or ball). Our adversaries have discovered the fact that winning the right games leads to victory in the whole match even if they have lost more exchanges.

The consistent development of the forces, the planning, the accurate estimation, and perhaps even the smart surrender of some of the less important parts of the match in order to spare energy can and, as a rule, also do very often lead to general victory. More than ever before it is important to predict the enemy's will to fight, his ability to continue and his readiness to innovate his approach and strategy. For this purpose, we need to know the social environment, state structure, effectiveness of the economy and quality of governance. All these factors are not unknown, but we are still playing football on a tennis court at Wimbledon.

Nothing new under the sun, but...

Let's have a look at some examples of new phenomena in the current security environment:

1. It is the first time in history when the military is not in the lead in innovations;
2. Military and civilian environments are getting mixed again. The borderline between police and military was just a temporary derivation from the normal mixed environment and it does not exist anymore;
3. The third civilization wave (Tofflers) brings a deep change in economic and military affairs;
4. Social media and the whole cyberspace created a completely new dimension of warfare;
5. The balance of powers will be impacted not only by the Thucydides trap leading to confrontation of the current “globocop” with rising new economic powers. The proliferation of autonomous miniaturized weapons, cyber operations and knowledge about functions of social organisms will create a high number of “triggers” capable of endangering actual fragile equilibria.

We focus on points, not on the evolution (which never ends)

The metamorphosis of war permanently brings new challenges. For example, the future war will be typical by the fact that we will not realize that it has already started (Řehka). The armed conflict is now more than ever before a process or evolution, but for

the reasons mentioned above the western military culture is obsessed by reaching a decision point in the sense of a sports match (Hanson). It has its logic when we target the enemy's centre of gravity in the decisive battle but it might be highly counter-productive if a competitor declaring himself to be our adversary changed his objective – which has actually happened.

The (military) objective is not necessarily one point. It is a vector!

The example might be the so-called Russian New Generation Warfare - RNGW. This concept is highly complex and - like in president Putin's loved activity judo – is based on the use of enemy's strength against himself. In a changed military environment, based on information -more than hard power, one of the objectives is not a victory in a high-intensity conflict but the regime change in the targeted state or at least the weakening of its social cohesion and the legitimacy of governing. Russia is economically too weak to fight a large war but in the endeavour to achieve the effects mentioned above Putin will use any level of influence other than war. *“It does not mean that violent instruments are unacceptable. Even though not all regime changes have to be done by military means, but when a military lever is activated, it is done by, with, and through segments of the local population”* (RNGW Handbook).

Russians and (in quite different ways) the Chinese follow the whole process and they use every useful phenomenon including the potential fragility of the system itself. Their goal is not to reach just one final point, but to understand and then (mis)use long time processes. Their effort does not have one stable objective. It changes very often and it has no clear end. That is why Russians speak about a permanent conflict. It is a wide vector and not only a point. How to work with vectors in our planning process?

How do we evaluate future threats - PESTLE¹, PMESII²/ASCOPE³?

Not only intelligence officers are familiar with the abbreviations mentioned above because some of them are used for example in the business environment too. Although the use of these concepts became routine in the western military environment, it seems that the way we use them has become cut-and-dry (at least less effective). Even though PMESII/ASCOPE cross evaluation might be highly effective (and it is when fairly processed) it does not reflect some long-term processes. Not only do we focus just on short-term objectives, but very often we prepare such evaluations only formally.

The reason why I am discussing this is that the Punctuated equilibria theory offers us some new instruments, which may upgrade our current process of future development evaluation. The concepts we use now might be upgraded by some new ideas arising from the punctuated equilibria theory.

BATTLE-MERV

¹Political Economic Sociological Technological Legal Environmental

²Political Military Economic Social Information Infrastructure

³Areas Structure Capabilities Organization People Events

Especially soldiers usually differentiate between military and non-military means; however, it is just an artificial border. The research of academics around the think-tank Complex societies has defined some interesting phenomena which are typical for nearly all complex societies and which seem to be based on the same principles not only in the past but even in the current situation. All the parameters mentioned further arise from the punctuated equilibria theory and may offer new instruments to our evaluation of security threats because nearly in all previous complex human societies they had similar basic principles of development.

With the exceptions of Time series and EROI the parameters mentioned further have more or less a positive or at least a neutral meaning. Nevertheless, it is necessary to admit that former positive functions later very often degrade and have a negative impact. As professor Bárta says in so-called Hérakleitos Law: *"Every system is exhausted by the same factors that led it to its peak.,,"*.

The BATTLE-MERV set of parameters is:

Bureaucracy and **A**dministration are irreplaceable instruments for control of complex processes and for governance. In later stages, they degrade so fast that it consumes more energy than it saves. The hypertrophy of bureaucracy and erosion of administration might be survivable in a growing economy. In a system which stagnates, it multiplies the other negative effects.

Time series – long-time series are the most important instrument (not a parameter) of how to evaluate processes in human history.

Technology evolves in a deeper complexity of sophisticated systems, but some innovations are in some points faster than the society's ability to absorb them.

Legitimacy is the key presumption of stability of any social structure. Very often the crisis of elites is one of the basic reasons of state power exhaustion.

Education seems to be a permanently growing parameter but, in fact, it oscillates in its quality.

Mandatory expenditures are in modern societies joined with social and health care, but the main problem is a growing rigidity of such systems, which is unable to flexibly redirect the flow of sources when it is necessary. Moreover, any reduction of expenses is impossible. The trend of rising of mandatory expenditures is permanent in nearly all state structures.

EROI - The Energy Return on Energy Invested concept might be applied to all human activities, the most important are industry and agriculture. The oscillation of the proportion invested/exploited is natural, but lack of innovations or sources contributes to and sometimes causes instability.

Redistribution mechanisms are a good parameter, which is useful especially in the long-term processes. For example, the disruption of the sharing of sources might indicate future tensions and disturbances.

Verticality is a term used for common ideas shared in the society. The loss of spirituality or at least shared basis of the regime legitimacy is another phenomenon used especially for social psychology purposes.

DIPPL (just another combination of similar parameters):

Distribution - redistribution of the accumulated economic potential and the investment efficiency.

Identity - the loss of the population's identification with society (dissatisfaction, inhumanity, frustration)

Participation - the ways and extent of participation of ordinary citizens - members of the state administration system

Penetration - the ability to control development (center/periphery), the enforcement of central decisions at the local level.

Legitimization - the degree of recognition of the right of the elite to rule the rest of the population.

Conclusion

I don't think that we shall complicate our current evaluation processes by further complicated mechanisms. Nevertheless, I tried to explain that we should change our approach by understanding long-time development principles in ecology, resources, economic, technology and population development.

All the mentioned terms are just a part of a theory and it is necessary to prove its applicability with hard data. For the purposes of this article, it is not possible to explain all the aspects and, to be fair, we are still working on them. The amount of data which have to be analysed is huge but till this moment every additional research seems to confirm the basic idea. In partial sets of statistical data we can see the decline of violence but, on the other hand, there is a significant increase of a Great Powers' Assertiveness index which – based on economic changes - may lead to the so-called Thucydides' Trap. In 60 cases from 67 similar situations in human history, it has led to armed conflicts. It is possible to work with a phenomenon like water scarcity compared to the World Food Price and a Fragile State Index or with the Men/Women ratio and a number of other phenomena. It seems that big data, long time series, statistics, modern software and social sciences offer us new instruments which might be highly useful in the military environment.

The punctuated equilibrium theory is detailed in articles of professors Bárta and Kovář and general Řehka but there is still a long way to prepare a functional but simple concept which will be applicable in the military environment. However, it works.

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