

# THE EFFECTS OF NUCLEAR WAR AND THE IMPACT ON THE SOCIAL ORGANISATION OF THE MODERN NATION-STATE

**Mario MARINOV**

Ph.D. Student, University of Library Studies and Information Technologies, Sofia, Bulgaria  
*m.marinov@unibit.bg*

**Abstract:** *The prospect of a nuclear conflict can be viewed as a concept of terrifying significance to civilisation. It is a contingency that is the antithesis to human existence in organised societies. The following paper is an examination of the effects, which can be brought upon mankind through the large-scale deployment of nuclear weapons and the impact upon the structure of modern civilisation, viewed through the lens of organisations theory. The paper presents some of the principal short-term and long-term consequences from the utilisation of nuclear weapons, based upon research covering the past five decades. The paper examines the impact of nuclear weapons on society by presenting the modern nation-state as a complex social organisation, whose social structure and complexity would be severely degraded. The paper concludes that the deployment of nuclear weapons in the modern era would have consequences of utmost severity in transforming national societies and the nation state, severely altering, or outright eliminating their ability to function effectively and necessitating societal readjustment and even devolution to ensure survival.*

**Keywords:** *nuclear weapons; nuclear conflict; social organization; societal collapse.*

## Introduction

Since the invention of nuclear weapons, the notion of major societal collapse brought upon by their deployment *en masse* has been at the forefront of arguments against the existence of such weapons, or on the contrary as an argument for continued global peace through nuclear deterrence, and the fear of such an event ever occurring. Regardless, both lines of argument have been based upon the complex examinations associated with the sheer potential destructive power of nuclear weapons, and the cascade of catastrophic consequences their deployment could have for humanity. Even in the third decade of the 21st century, when three decades have passed after the conclusion of the Cold War and the greatest concentration of nuclear weapons in history, the overall consensus remains that nuclear weapons still possess the ability to bring about an event of global proportions and of extreme consequence for the continued progress of human civilisation.

The **object of study** of the following paper can be found in the principal notion of the examination of the effects of a nuclear scenario, a nuclear contingency, as crucial in understanding the vast and impactful array of effects that its outcome could have. The deriving **subject of study** of the paper is expressed in the expected aftermath of such a scenario arising in its direct and indirect, short-term and long-term effects and consequences, and their propagation in undermining the basic structures of the societies, examined through the lens of organisational theory, or more specifically the ability of social organisations in their national form to survive large-scale post-nuclear devastation.

The **main objective** of the present paper is to further the discussion on the impact nuclear weapons deployment can have upon societies and nations, and thus to emphasise the need to prevent such a scenario from ever materialising. Within the sections of the paper, **further objectives** are: to present and contrast existing research and information into the effects of large-scale nuclear exchanges; to present the complexity of the modern nation-state through the notion of a complex social-organisation; and finally, to present how the effects

from nuclear warfare could serve to severely degrade the structures of social organisations and the nation-state itself.

The **principal thesis** of the paper is that *in the contingency scenarios of either limited or full-scale nuclear war materialising in the current era, contemporary national societies within the nation-state structure, as the highest order of a social organisation, will face a deluge of unprecedented challenges to their organisational societal order with societal structure being severely degraded due to the short and long-term, direct and indirect effects of nuclear devastation, and forced to undergo a process of substantial negative transformation in order to ensure survival.*

The paper will in its first section provide for the description of some of the most impactful conditions that are expected to arise in a nuclear scenario, thus setting the preconditions for the exploration of societal structure in a post-nuclear environment. In its second section, the paper will provide for the theoretical assumptions of the evolution of social organisations, contemporary societal structures within organisations theory. In its third section the paper would attempt to connect the conditions of a post-nuclear environment with effects that such an environment could have on said societal structures, as well as expand upon the challenges they could face.

In addition, the following paper will adhere to several **limitations in the scope** of its research. As the paper sets out to provide for the general correlation between the integrity of social organisations and their transformation in the aftermath of nuclear devastation, the social organisation shall be viewed broadly, pertaining to the nation-state and the nation as the current highest order of social organisation, but without application to any particular one. The reasons for such a necessary limitation pertaining to the very essence of diverse social organisations and their environment being subjected to a variable experience and reacting differently in a nuclear contingency. Additionally, when presenting the effects of a nuclear crisis, that could afflict societies to varying degrees of severity, the paper would attempt to be brief and concise, the nature of such scenarios presenting numerous factors with a diverse set of values and outcomes, with the source literature providing extensive research into each and beyond the limitations in size and scope of this paper. The paper will furthermore focus chiefly on the aftermath of a regional or global nuclear conflict, as more limited contingencies, whilst devastating and impactful, even beyond the area of their immediate occurrence, are assumed to be unable to create the conditions for widespread societal and environmental transformations as discussed within this paper. Finally, the following paper would not discuss the prime subject matters of nuclear deterrence and prevention of such contingencies from occurring in a direct approach, the opinion provided here is that only through the awareness of the severity in consequences of nuclear war, an awareness that had persisted in the past, its ultimate manifestation can be truly prevented.

When discussing the effects of nuclear warfare and its aftermath in the current era, and not in any particularity to the following paper, a necessary point should be made as to the research utilised and the general state of such research leading up to the present moment. The following paper utilises sources, which can be summed up in two broad categories – material produced in the Cold War-era and material produced in approximately the last decade up to 2022. An additional extrapolation is necessary in order to further define the quality, applicability and relation of such research to the topic of the paper, the overall notions of the subject matter, and the necessity of remedying an existing “knowledge” and “culture” gap within contemporary societies.

Research produced during the Cold War into the effects of nuclear warfare upon societies and nuclear war in general commenced immediately following the first application of atomic weapons at the end of World War II and the subsequent observations in its aftermath. Such initial research material marks the first extensive forays into the effects of

initially atomic and by the late 1950-s nuclear weapons upon civilisation and humanity at large, and as such suffers from the “teething problems” associated with any novel field of research.

By the 1970-s and 1980-s, academic research demonstrates a far more profound and refined understanding of the risks associated with nuclear war and the disastrous effects of it occurring for humanity. Research, especially from the United States, where it is more openly available, provides for extensive and meticulous examples of analysis of most elements and situations pertaining to a large-scale nuclear conflict and its subsequent aftermath. With such research, being now declassified, offering a formative source of information for contemporary researchers, and is also of prime interest for this paper. However, the direct and unapprised application of such sources to the contemporary period suffers from the innate predicaments of the passage of time since their creation and the vast societal changes that have occurred over the past decades, as well as the focus of their analysis on a single national society – a singular example of such a predicament can be seen in the organisational structure and characteristics of a nation state of the 1980s, such as the United States or Soviet Union, whose economies, security branches, political elites, populations, et cetera, would have been prepared and organised in a very different manner and in an environment preconditioned and fully aware of the eventualities of the sudden eruption of a nuclear conflict, compared to the same in the world of today.

The changes to the strategic environment after the Cold War precipitated what can be defined as a subsiding focus on the subject matter of nuclear war and increased optimism towards the rigidity of the international system of the 21st century to prevent such a contingency from ever arising. Increasingly this trend has been reversed and should be seen as a temporary, albeit impactful pause in necessary public attention and scientific study. The threat from nuclear terrorism, rogue states initiating limited nuclear war, and more recently the very real prospects of a hard-line geopolitical fragmentation of the international system into opposing blocs of power in a relationship of uncertainty, competition and confrontation reminiscent of the Cold War, has steadily brought back the spectre of potential nuclear disasters occurring.

Current literature has focused widely on analysing the current strategic nuclear balance between major nuclear powers, the prospective threats arising from expanding and evolving nuclear arsenals in purely technical terms and to a lesser extent the evaluation of the readiness of contemporary social systems in handling such events and the potential consequences arising from diverse contingencies. As such, the level of societal engagement and academic research is far lacking compared to the levels present in the Cold War, and whilst it is a near certainty that such matters of research debate are present within security circles across the globe, producing classified results, the following paper focuses and utilises openly available materials and wishes to further enhance the need for the examination of a crucial and existential topic.

## **1. Effects of Nuclear Weapons Deployment**

The deployment of nuclear weapons will be a devastating scenario for mankind and civilisation. It is thus necessary to first summarise the sequence of events that transpire in the aftermath of their deployment and the overwhelmingly devastating environment that nation-states and societies will find themselves in. This will be split up into two categories that establish a chronology of the preconditions for societal existence in a post-nuclear environment – direct effects and short-term consequences, pertaining to the immediate moments after the deployment of nuclear weapons, and indirect and long-term consequences,

pertaining to the effects deriving from the employment of nuclear weapons on a wider scale creating a self-propagating effect of vastly increased destructive consequences.

One type of scenarios envisioned in broader scientific discussions are singular or limited nuclear detonations, usually associated with nuclear terrorism or a rogue state actor with limited nuclear potential. In such scenarios, whilst nuclear devastation will be present, and the immediate and short-term effects will materialise, it is expected that the nation-state will be able to afford the necessary capabilities to mitigate the consequences for society. The second and third scenarios envisage nuclear exchanges on a much broader scale, involving several actors, and resulting in either a regional, or global nuclear war. In both cases, especially in the latter, the far-reaching indirect and long-term effects of nuclear weapons employment are expected to truly manifest, coupled with a significant reduction of the response capabilities of the nation state and society. The latter two scenarios are of higher interest, as they present potentially insurmountable challenges. The information provided is based on established prognosis from the Cold War-era and later re-evaluations, established in more recent times though the use of modern modelling capabilities. It should be of notice to the reader that, whilst there is general consensus on the overall expectations of what could transpire in the event of a global or even regional nuclear catastrophes, the associated variables and sequence of probable events make a wholesome picture impossible to predict, with only a portion of these being mentioned here. There exists an expansive debate on this subject matter with logically formulated arguments against some of the most severe outcomes predicted; however, these are beyond the scope of the present paper.

### *1.1. Direct effects and short-term consequences*

The first effects to be felt in a nuclear scenario, occurring consecutively with the “double-flash” event of a nuclear explosion, which is likely to cause differing levels of “flash-blindness” in both protected and unprotected observers (Hoerlin 1976, 11-12), are those of the electro-magnetic pulse (EMP). The EMP can cause substantial damage to any unshielded electronics, particularly ones connected to wider power grids. Depending on the altitude of nuclear detonation, which in the suppression phase of a nuclear conflict is expected to include detonations in extremely high altitudes, will likely blanket vast swathes of territory, thousands of kilometres in radius (Hoerlin 1976, 17-20, The Comprehensive Nuclear-Test-Ban Treaty Organization 2020).

Within seconds, the fission-fusion-fission processes of the nuclear detonation would have developed the so-called “nuclear fireball”, which would, depending on the size and altitude of detonation, subject its immediate environment of several hundred meters in radius (megaton-range weapons can reach several kilometres) to temperatures of several million degrees Celsius (Glasstone and Dolan 1977, 24), but would also induce extensive thermal injuries in unprotected individuals far beyond, up to distances of several kilometres, as well as extensive radiation burn injuries due to exposure. The thermal radiation released would also be the facilitator of firestorms across affected areas, which researchers since the late-Cold War have expected to cause damage equal or even exceeding that of the initial detonation (Office of Technology Assessment 1979, 5-6) especially in urban and industrial areas, but the full effects of which materialise only later.

At this stage of the nuclear detonation, the fireball would also have deposited enough energy into the atmosphere to produce nitrogen oxides (NO<sub>x</sub>) (Hoerlin 1976, 33, Bonner 1971, 4). The fireball of nuclear weapons in the higher kiloton range of about 800kt (the highest yield of most current era weapons as per Kristensen and Korda (Kristensen and Korda 2021, Kristensen and Korda 2021), have been modelled since the Cold War to be able to inject NO<sub>x</sub> directly into the upper stratosphere, thereby setting the first phase of a deadly process of ozone layer depletion. A recent 2021 study “Extreme Ozone Loss Following

Nuclear War” in the Journal of Geophysical Research has concluded this known quality of nuclear detonations to be only the starting point of a much larger disaster, which will be described in the later and longer lasting effects of a nuclear crisis.

Depending on whether the nuclear weapon was detonated at altitude (air-burst) or at ground/below-ground (surface-/subsurface-burst), the nuclear explosion would produce varying levels of physical damage. Air-burst detonations results in a pressure wave that affects a far larger circular area and are most effective against large urban population and industrial centres, as well as non-hardened targets of military importance. Surface-/subsurface-burst detonation tend to be aimed at specific hardened targets, limiting the resultant pressure wave, due to the ground absorbing much of the energy; however, causing severe seismic shock and more importantly ejecting large amounts of irradiated surface strata into the atmosphere, increasing the subsequent fallout effects.

All of the above are immediate effects, which whilst potentially causing substantive damage and creating a situation of direct and severe consequentiality to civilian populations and societal order, could also be limited in their impact on civilian populations. It must be noted that whilst the general image of a nuclear exchange, established in the social imagination since the Cold War, envisages the immediate destruction of urban population centres, such a scenario would be highly dependent on the specific contingency unfolding and the capabilities in qualitative and quantitative terms, as well as strategy of the nuclear states partaking in it. And whilst the above described immediate effects of nuclear detonations, and especially ones from higher-yield nuclear weapons, might not be directed at civilian population centres themselves, but instead against strategic military targets, the below expansive effects from nuclear weapons deployment are likely to manifest regardless.

### *1.2. Indirect effects and long-term consequences*

Following the nuclear detonation itself, numerous other consequences will begin to materialise, all worsening the severity of the nuclear disaster. These consequences would materialise in an environment where the ability to counteract the initial effects of nuclear exchange has been severely degraded, thus exponentially increasing their impact and severity.

The aforementioned high-altitude and even exo-atmospheric detonations, aside from the initial EMP effects, would deposit large amounts of high-energy particles in Earth’s magnetosphere, thereby creating what is termed an “artificial radiation belt”, which would have disastrous effects for most space-based infrastructure. The extent of such radiation belts would vary based on the nuclear conflict envisioned, but in higher estimates, they would cover extensive portions of the inner region of Earth's magnetosphere (The Comprehensive Nuclear-Test-Ban Treaty Organization 2020, Hoerlin 1976, 23-29).

The emergence of firestorms, as previously stated, has been judged to be a factor of equal or even much greater destructive capacity than that produced by the sheer destructive potential of the nuclear explosion itself. Such firestorms can potentially consume the remnants of any urbanised centres, further debilitating conditions within them, and can quickly continue to consume even larger territories spanning entire regions of the globe, dependant on the specifics of the region and state subjected to said effects. Such firestorms eject additional quantities of soot into the atmosphere, extending the effects of the radioactive fallout, but also creating the circumstances for a hypothesised cycle of continued heating of the planet and later exponential cooling, resulting the proverbial arrival of a “nuclear winter”. The deposition of enormous quantities of matter in the upper atmosphere generating initially a greenhouse effect assisting in the propagation of such firestorms, but later creating a solid barrier against the sun, causing a dramatic cooling effect. In the hypothesised effects of the nuclear winter, some models have projected to creation of an environment with a global cooling level of -5 to -7, and cooling of the North American and Eurasian landmass by a factor of between -20 to -

30, respectively, for up to a decade (a commonly provided comparison is the cooling of the last major ice age, where the cooling factor is supposed to have been only -5) (Robock, Oman and Stenchikov 2007, 1-16).

Aside from the conditions leading to a nuclear winter, recent research on the scale of the impact of nuclear detonations on the ozone layer has established new findings on the additional effects of firestorms leading to an even more apocalyptic picture than the one previously established by Cold War-era research. In addition to the nitrogen oxides deposited into the ozone layer during initial nuclear detonations – a process that had been previously evaluated to possibly eliminate only 5% of the ozone layer and in a period where the planet is blanketed by a layer of soot particles that blocks solar radiation regardless; contemporary research has modelled the ability of firestorms themselves to deposit far greater quantities of NOx's in the upper atmosphere than previously projected. After the subsiding effects of the nuclear winter, which could last several years, the degradation of the ozone layer in such a model, which envisions the deposition of 150tg of soot in the atmosphere (soot concentration per current inventories and megatonnage, and the common upper limit on most contemporary models on soot deposition), could reach a 75% reduction of the ozone layer for a period of at least an additional 10 years past the expected duration of the nuclear winter. These later effects, would constitute the additional effects of a proverbial “nuclear summer”, where UV light exposure across the globe, for surviving human, animal and plant life is far beyond survivable levels (Bardeen, et al. 2021, 1-22).

Following the unprecedented and inhumane tragedy that would be a nuclear war, the world would have been changed invariably into a hostile landscape for a period of time that could prove disastrous for human societies.

## **2. The Social Organisation and the Problem of the Modern Nation-State**

In examining how the consequences of a nuclear conflict will manifest in the degradation of the ability of the nation-state to exist, it is important to understand the essence of the nation-state itself. This “essence”, within the following paper and within organisational theory, and in particular the understanding of the state as a social organisation is made of several core tenants that focus on the evolution of the social organisation, social structure and interactions within the state, as well as the principal objectives of its existence.

The existence of any social structure materialises along three core objectives, or tenants, which are applicable to any social organisation across time, and as such, and even within the contemporary structure of modern societies, stand as irreplaceable axioms of both individual and collective human societal existence. These are namely:

- To ensure long-term existence through continued procreation.
- To ensure survival through the pursuit of security against threats.
- To acquire resources, create goods and increase affluence.

These core tenants, have been at the mainstay of societal evolution, as examined within organisational theory, leading up to the nation-state of today. All three can be viewed as pivotal in the gradual evolution of human societies and civilisation as a whole. Based on their fulfilment, a functional and organisational structure is established within societies, which evolve to be more complex as the society in question expands and becomes more numerous. The overall “fulfilment” of these objectives, within organisations theory has been termed “*social fulfilment*” (Manev 2012, 120-122).

As social organisations have transitioned in their evolutionary stages based on the innate ability and precondition to *self-organise* (to achieve the above objectives) from initially the first-level social organisation of kin to the second-level kin-based union (*fratria*) and later tribe, to finally the third-level social organisation of the nation-state, their complexity has

grown in terms of their internal structures. These internal structures, functional and organisational in nature have the task of achieving “*social fulfilment*” (Manev 2012, 122-123). The optimal values for achieving them have naturally progressed as the nation-state has expanded over the centuries, growing in complexity and sophistication. As such the nation-state of today is a very complex social organisation where the nation-state possesses a diverse range of compound and interconnected web of subsystems, which must work in concert in order to ensure the stability of the complex social organisation of the nation-state. The pursuit of the objectives of the modern nation-state have led over the centuries to the current form of global societies, where they can be defined as becoming highly urbanised, non-self-sufficient, and highly interconnected with other nation-states for their survival, whilst also including an ever-expanding array of goods and services necessary for the functioning of the society itself in a level of sophistication that is incomparable to societies from even three decades ago.

However, the complexity and sophistication of the social organisation also ensures that the emergence of sudden major and unsurmountable challenges to its every subsystem will produce a far more severe impact.

In more illustrative terms, the elimination of much of the ability to produce food sustenance would be more impactful to the overall organisational level of a society of several million people, compared to a society of several hundred thousand. The same applies to every other matter of dependence that a more sophisticated and advanced society has come to include in its organisational structure.

Thus, a social organisation on the scale of the modern nation-state, can be stated to be exceptionally vulnerable, based on the fulfilment of the core objectives for its survival, to the mass and sudden effects precipitated by the contingency of a wider nuclear exchange. In such a scenario, the functional and organisational structures, built around maintaining its complexity and sophistication, will be placed under the conditions of a potential environment where such a higher-level social organisation may not be able to function at all.

### **3. The Effects of Nuclear War on the Nation-State**

As demonstrated by the previous sections of the paper, large scale nuclear conflict could have devastating effects extending to the basic structures of contemporary civilisation. The nation-states that make up the international system of today will be faced with a vast array of immediate and incrementally increasing challenges to their systemic structure and the ability to maintain integrity. Within this final section of the paper, the described effects of a large-scale nuclear exchange will be further expanded in their direct impact on civilisation and juxtaposed with the modern social construct of the nation-state with the goal of defining the challenges to be faced in ensuring continued societal existence of the modern social organisation.

Within the short-term consequences of nuclear war, it is expected that societies will first undergo a significant initial depopulation event. Beyond initial casualties due to nuclear detonations themselves, the destruction of urban centres, would be the principal first point of reference in the transformation of society. In the contemporary constructs of nation-state, cities form the principal units of human cohesion and concentration. They are the human centres of highest dependence on the effective functionality of the nation-state, the highest producers and highest consumers of goods and wealth, and as such they are the most vulnerable to sudden and large-scale changes.

The destruction of major cities would greatly correspond in a lapse of capabilities to ensure further loss of life due to the collapse of emergency services and the ability to communicate and coordinate effectively in a nuclear environment. Such effects, especially in well-urbanised centres have been predicted and described since the Cold War. In a 1979 study

on the “The Effects of Nuclear War”, conclusions are made as to the ability to respond to casualties in a nuclear environment, namely that even without significant degradation to medical installations, the ability to effectively treat all casualties, which could number in the hundreds of thousands in major urban agglomerations, would quickly overwhelm health services (Office of Technology Assessment 1979, 32-34). A later 1986 study on the “Medical Implications of Nuclear War” makes similar conclusions as to the ability to effectively deal with the initial human impact of a nuclear scenario (Solomon and Marston 1986, 349-381). The authors of the 1979 paper go as far, as to make a bold, morally ambiguous, but nevertheless truthful and logically founded statement that any preparations made to lessen the immediate impact of a nuclear conflict on the population in cities is likely to be partially or completely irrelevant in alleviating the societal impacts that are to follow (Office of Technology Assessment 1979, 3-5).

The initial impact on cities, as well as other affected areas by either direct nuclear detonations or more importantly spreading nuclear fallout, would be further exacerbated by the need for surviving population to relocate. This process would create a wave of human displacement from affected areas to unaffected areas, with the displaced populations requiring shelter, uncontaminated food and water, specialized healthcare, whilst also bearing the aftermath of a collapsing society prone to violence for remaining resources (Bagshaw 2014, 1-5).

Regardless of the initial count of survivors in any given nation-state, the long-term prospects for ensuring their security and social cohesion are considered even grimmer based on the general assumption that a contemporary post-nuclear society would be unable to sustain itself in terms of even feeding large populations. Initial effects of radioactive contamination, as well as the destruction of food storage and distribution infrastructure, would imply the general lack of sentence in the immediate aftermath of a nuclear conflict. However, the long-term effects, previously described, of initial global cooling (nuclear winter) and later global heating (nuclear summer) for a period of up to two decades creates the context of what has been defined a “nuclear famine”. As such even relocated societies would be faced with a gradually diminishing and later greatly degraded available food sources of more than 40% compared to pre-nuclear yields for at least the first decade (if only taking into account the effects of a nuclear winter and not a potential later nuclear summer), especially in affected areas of the northern hemisphere (Mills and al. 2014, 14-24, Solomon and Marston 1986, 284-290).

In the period following a wider nuclear conflict, the capability of the nation-state to function would have been deeply degraded, not the least because the cornerstone for its functioning as a social organisation would have collapsed completely or would have been severely undermined. The principal objectives to ensure the availability of resources, in their most basic form, such as water and nutrients, would have been radically transformed to a level, which even considering initial great loss in life would be unable to sustain the remaining population. The vast complexity of modern nation-states would in turn act against the ability to introduce measures of effective control of the situation. In such a context, the ability for the social organisation and its subordinate structures of control allowing the ability to self-regulate and reorganise would have been hamstrung by the collapse of effective political control and communication, and the widening pressure of a society, which is quickly losing the ability to provide for itself. In the long term, the effects of nuclear conflict, have been projected to severely impact the ability (and general notion) of a society to ensure continued survival through procreation. The immunological and genetic impact of nuclear warfare, which could initially be perceived as trivial in comparison with the short-term catastrophic consequences, have been pointed out to over time accrue an ever-expanding complex of severe effects for not only the surviving population, but a generational heritage



among survivors and their offspring, which will additionally strain efforts at societal reconstruction (Solomon and Marston 1986, 314-349).

Without doubt, the effects on the nation-state and human societies in general would extend much further than the few examples provided above, and would also include unexpected variables that would manifest only once such a catastrophe has taken place.

### Conclusion

The prospect of a nuclear conflict engulfing humanity is a terrifying one. The initial impact of nuclear weapons deployment upon the social structure of the modern nation-state would be severe.

Nuclear weapons, in their pure destructive, but more importantly in their collateral effects, would create a global environment radically different and hostile to the one currently inhabited and attuned to the needs and functioning of modern societies. As such, in the event of a wider nuclear conflict, the nation-state, which can be viewed as a social organisation, structured around the maintenance and survival of any given society, would undergo radical transformations, that would greatly degrade the ability to maintain cohesion and order. Thus, the social organisation of a post-nuclear world would potentially be very different from the social organisation of the modern-nation state, necessitating the further question as to how far back in terms of basic social structures and societal levels, would humanity be propelled in order to ensure some measure of renewed stability and future survival. Whilst, a nuclear crisis would be an event of near unparalleled impact upon humankind, it is also of note, that societies in the past have reformatted themselves based upon existential dangers, suffering through periods of great decline, but emerging in a new form to continue the existence of the species.

### Bibliography

- Bagshaw, S. 2014. *Population Displacement in the Aftermath of Nuclear Weapon Detonation Events*. Conference Paper, Vienna: United Nations Institute for Disarmament Research.
- Bardeen, C. G., D. E. Kinnison, O. B. Toon, M. J. Mills, F. Vitt, L. Xia, and et al. 2021. "Extreme Ozone Loss Following Nuclear War Results in Enhanced Surface Ultraviolet Radiation." *Journal of Geophysical Research: Atmospheres* 1-22. doi:10.1029/2021JD035079.
- Bonner, N. 1971. *Nitrogen Oxides in the Stratosphere from Nuclear Tests: Effects on Ozone Concentration*. Livermore: Lawrence Livermore National Laboratory.
- Glasstone, Samuel, and Philip J. Dolan. 1977. *The Effects of Nuclear Weapons*. Washington, D.C.: United States Department of Defense.
- Hoerlin, Herman. 1976. *United States High-Altitude Test Experiences: A Review Emphasizing the Impact on the Environment*. Los Alamos, New Mexico: US Energy Research and Development Administration.
- Kristensen, H. M., and M. Korda. 2021. *Russian Nuclear Forces*. Bulletin of the Atomic Scientists.
- Kristensen, H., and M. Korda. 2021. *United States Nuclear Forces*. Bulletin of the Atomic Scientists.
- Manev, E. 2012. *Global, Regional and National Security*. Sofia: Softreid.
- Mills, Michael J., and et. al. 2014. "Global Famine after a Regional Nuclear War: Overview of Recent Research." *Earth's Future*. National Center for Atmospheric Research.

- Office of Technology Assessment. 1979. *The Effects of Nuclear War*. Washington D.C.: Office of Technology Assessment.
- Robock, Alan, Luke Oman, and Georgiy L. Stenchikov. 2007. "Nuclear Winter Revisited with a Modern Climate Model and Current Nuclear Arsenals: Still Catastrophic Consequences." *Journal of Geophysical Research* 112: 1-14. doi:10.1029/2006JD008235, 2007.
- Solomon, Fredric, and Robert Q. Marston. 1986. *The Medical Implications of Nuclear War*. Washington D.C.: Institute of Medicine.
- The Comprehensive Nuclear-Test-Ban Treaty Organization. 2020. *9 JULY 1962: 'STARFISH PRIME', OUTER SPACE*. Accessed May 22, 2022. <https://www.ctbto.org/specials/testing-times/9-july-1962starfish-prime-outer-space>.

\* The following paper has been prepared within the framework of the “National Science Programme – Security and Defense”, with decision No. 731/21.10.2021 of the Parliament Assembly of the Republic of Bulgaria.